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MEASURES OF PROPER MOTION STARS

MADE WITH THE

40-INCH REFRACTOR OF THE YERKES OBSERVATORY

IN THE YEARS 1907 TO 1912

BY

S. W. BURNHAM

1902

WASHINGTON, D. C.
Published by the Carnegie Institution of Washington
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QB811
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CARNEGIE INSTITUTION OF WASHINGTON
PUBLICATION No. 168

ASTRONOMY DEPT.

The Lord Baltimore Press
BALTIMORE, MD., U. S. A.

INTRODUCTION

The measures which follow were made with the 40-inch refractor of the Yerkes Observatory in the years 1907 to 1912. The mean results of prior measures with the same instrument in 1897 to 1906 are given in the *General Catalogue of Double Stars* (Carnegie Institution of Washington, 1906). These observations have been made in the usual way, fully described heretofore; and, as far as possible, each star has been measured on at least three nights. The most probable value of one revolution of the micrometer-screw, as found from a large number of observations, is 9″.666; and this value has been used throughout the work at the Yerkes Observatory.

The larger number of stars selected for measurement, given as Part II of this volume, are taken from the *General Catalogue of Double Stars* for reasons which will generally be apparent from the notes and observations cited in that work. By far the greater number of stars given in the *General Catalogue* as having proper motion are not included here, because the observations there cited are of recent date and further measures are not needed at this time. Many hundred examples of proper motion stars of this kind will be found there, and in that respect this work is supplementary to the *General Catalogue.*

The other list, forming Part I, includes all other stars for which prior observations with the micrometer have been made. Unfortunately the early work in this field is confined to a few observers, the principal ones being Otto Struve, Engelhardt, and Ball. For some of the other stars recent photographic positions have been found, but in most cases the time-interval is too short to give a very accurate value of the relative change. This objection will be removed by observations to be made hereafter.

The small stars from Zone 26° of the *Oxford Astrographic Catalogue* are taken from a list prepared by Mr. G. H. Hamilton of the University Observatory. This list gives the place, proper motion, and photographic magnitude of some fifty stars, principally below the magnitude limit in Argelander, from plates taken for the most part in 1907 and 1908, the proper motions being derived from a comparison with other plates made a few years earlier. All of these were put on the observing-list and, as far as possible, compared with one or more fainter stars in the field. In a few instances there were no comparison stars within the range of the micrometer.

Boss (*Astronomical Journal,* 604) has called attention to a group of thirty-nine bright stars, principally in *Taurus,* which appear to have a common proper motion of approximately 0″.10 in the general direction of about 100°. These stars were placed on the observing-list, and nearly all of them connected with faint stars in the field for verification of the proper motions given from meridian positions. I have noted three other stars, overlooked by Boss, which evidently belong to the group. They are 37 *Tauri,* 55 *Tauri* (OΣ79) and OΣ82.

When there are prior measures of any of the comparison stars observed here which seem to warrant a conclusion as to the movement of the proper motion star, the result is given and compared with former values derived from observations with the meridian circle. When the proper motion is small, say a tenth of a second of arc or less, the separate determinations from meridian positions by the leading authorities on this subject are apt to be discordant and incon-

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sistent, in some instances to the extent of having the proper motion star moving in the directio of three different quadrants.

When, as usually happens, the measures of small stars in the field give a more or less diffe ent movement from that taken from the star catalogues, it would be manifestly absurd, and i effect begging the whole question, to ascribe the difference to the proper motion of the faint sta There is at this time no relevant evidence of any character that any really faint star, not ass ciated and moving with a larger star, has any sensible proper motion at all. Of course this do not necessarily refer to all telescopic stars visible in small apertures. Occasionally a star faint as the eleventh magnitude has been found with a small motion, but these instances a rarer that one would expect. For many years I have been hunting for a faint star with so certain proper motion, but so far without success; and the observations of others to this ti give only negative results. It goes without saying that every star in the heavens, down to t limit of the largest aperture, must have some proper motion as well as parallax; and it is equal obvious that the one is as negligible as the other in all observations of relative positions with a astronomical instrument now in use. Possibly the present series of measures, when followed a half century or more from this time, may show that some one of the small stars now measur has a real and substantial movement in space. I sincerely hope this may be the result of furth investigations, but it will require careful and long-continued measures with the micrometer, a perhaps extended to other near faint stars not yet observed, to establish and confirm the su pected movement. Photography will doubtless contribute to this end, but the exposures w necessarily have to be much longer than those given to the plates of the several *Astrograph Catalogues* in order to reach the desired lower magnitudes. It should be remembered, in deali with magnitudes from these catalogues, and with photographic results generally, that the valu given make the stars from one-half to more than a whole magnitude fainter than the usual visu estimates of experienced observers.

All the star places given are for 1880 unless otherwise stated. For the greater conv nience of those who will use the observations hereafter, at the telescope or in the library, t original places as given in the *General Catalogue of Double Stars* have been retained, and t stars in Part I reduced to the same epoch. The total number of measures in the present work about 9500.

S. W. B.

PART I

MEASURES OF PROPER MOTION STARS

Bradley 3212 (6.4...9.4)

R. A. 0h 0m 24s Decl. + 28° 22′

A and B

1907.772	250°.27	158″.13
.788	250.34	158.15
.791	250.23	158.48
1907.78	250.28	158.25

A and CD

1907.772	184°.60	153″.62
.788	184.80	153.51
.791	184.95	153.44
1907.78	184.78	153.52

C and D (10.8...10.9)

1907.772	211°.0	3″.24
.788	208.7	3.27
1907.78	209.8	3.25

We have the following positions of AB:

1853.82	244°.32	143″.16	4n	OΣ
1863.81	245.50	146.21	2n	OΣ
1884.11	247.70	151.84	1n	HΣ
1886.97	248.22	151.89	2n	Eng
1895.03	249.16	154.99	4n	Eng
1907.78	250.28	158.25	3n	β

These measures give for the corrected proper motion of Bradley 3212:

0″.403 in 113°.9

This has been given from meridian observations:

Auwers	0″.415	in	117°.7
Porter	0.412	in	115.9
Boss	0.419	in	114.9

Engelhardt does not mention C as double, and it is uncertain whether his measures relate to C or D, these stars being sensibly equal in magnitude, and therefore the relative motion is of doubtful value:

1886.97	182°.28	156″.41	2n	Eng
1894.99	183.42	155.66	2n	Eng
1907.78	184.78	153.52	3n	β

DM (40°) 5 (7.2...10.1)

R. A. 0h 2m 38s Decl. + 40° 10′

A and B

1909.496	280°.80	74″.25
.512	280.90	73.81
.515	281.05	74.23
1909.50	280.92	74.10

No other measures of this.

A and β 483

1909.551	81°.78	145″.83
.570	81.68	145.91
1909.56	81.73	145.87

β 483 is the 7.0 m star, DM (40°) 7. The meridian positions indicate some change:

1879	80°.2	143″.8	A. G. Bonn

DM (63°) 3 (8.7...11.0)

R. A. 0h 3m 9s Decl. + 63° 17′

1909.496	68°.73	130″.16
.512	68.38	130.56
.515	68.58	130.51
1909.51	68.56	130.41

This is one of the red stars in Schjellerup; apparently without sensible proper motion.

1880.32	68°.45	130″.15	2n	Bl

There are several stars nearer than this; the nearest is 12.8 m:

1909.496	24°.4	24″.81
.512	23.6	24.78
.515	24.9	24.84
1909.51	24.3	24.81

γ *Pegasi*

R. A. 0h 7m 3s Decl. + 14° 31′

A and B (11.8)

1907.502	285°.50	163″.75
.523	285.38	163.51
.540	285.18	163.05
1907.52	285.35	163.44

The only other measure of this is:

1879.51	285°.6	161″.82	2n	β

These positions give for the proper motion of the large star:

0″.063 in 81°.8

The value of this movement from the meridian observations seems to be very uncertain:

Auwers (Fund.)	0″.016	in	218°.0
Auwers (A. N. 3508)	0.018	in	254.0
Newcomb (Stand.)	0.003	in	237.5
Newcomb (Fund.)	0.011	in	157.7
Boss	0.013	in	270.0

If there is no unusual error in the early measures, the motion is in the opposite direction from that previously given. Repeating these measures after a suitable interval will settle the question. Of course there is no probability that the small star has any motion. It has a small companion which I have measured:

B and C (11.8...12.4)

1907.502	197°.3	20″.49
.523	195.7	20.35
.540	196.0	20.28
1907.52	196.3	20.37

Nothing else of this but a rough setting:

199°.3 : 21″.0 (1879.47)

Oxford (Z 26°) 259 (9.8...)

R. A. 0^{h} 10^{m} $50^{s}.50$ Decl. + 25° 17′ 16″.0

The place of this star from the Oxford *Astrographic Catalogue* is for 1900, from plate taken 1907.79. From a comparison of this with an earlier photograph, the proper motion is given:

0″.159 in 99°.0

This star is DM (25°) 23 (9.2 m). A comparison of the above place with that in A. G. Camb. implies a small proper motion. The only available comparison star is problably too faint to appear on the photographic plate.

A and B (9.5...12.6)

1910.529	308°.90	111″.87
.570	309.13	111.67
.589	309.05	111.06
1910.56	309.03	111.53

Oxford (Z 26°) 355 (10.9 m)

R. A. 0^{h} 12^{m} $29^{s}.81$ Decl. + 25° 57′ 7″.6

This place (for 1900) is from the Oxford *Astrographic Catalogue* from a plate taken 1907.79. From a comparison with an earlier plate, the proper motion is given:

0″.186 in 36°.9

This is identical with the 9.4 m star, DM (25°) 26. Not in A. G. Camb. The two comparison stars measured should be on the photographic plates.

A and B (9.5...10.0)

1910.529	199°.73	80″.05
.589	199.75	79.99
1910.56	199.74	80.02

A and C (10.0)

1910.529	353°.00	126″.63
.589	352.85	126.36
1910.56	352.92	126.49

Groombridge 34

R. A. 0^{h} 12^{m} 33^{s} Decl. + 43° 21′

A and B

1907.463	56°.52	39″.02
.482	56.38	38.87
.485	56.65	38.68
.502	56.25	38.66
.523	56.57	38.90
1907.49	56.47	38.83

A and C

1907.463	120°.30	28″.30
.485	120.35	28.14
.502	119.93	27.75
.523	121.25	27.99
1908.518	125.40	25.70
.520	124.73	25.68
.537	124.30	25.85
.559	124.77	25.42
.573	125.40	25.66
1909.496	129.75	23.77
.512	129.24	23.47
.515	129.40	23.81
.570	130.08	23.68
1910.471	134.73	21.90
.473	134.80	22.23
.529	135.90	21.40
.605	136.41	21.81

The principal stars make a system of the 61 *Cygni* class. The difference in the proper motions is very small.

1860.18	52°.90	40″.05	1n	OΣ
1868.50	52.97	39.67	2n	OΣ
1875.41	53.84	39.61	2n	OΣ
1882.67	54.57	39.41	2n	OΣ
1905.88	56.25	38.80		Russell
1907.49	56.47	38.83	5n	β

The time of the measures of the fixed star is too short to make any correction to the recognised proper motion of A. This will be done from later measures.

1904.98	112°.57	34″.65		Russell
1906.78	118.10	30.16		Russell
1907.49	120.46	28.04	4n	β
1908.54	124.92	25.66	5n	β
1909.52	129.62	23.68	4n	β
1910.52	135.46	21.83	4n	β

The positions by Russell are from a photographic plate. (*Mon. Not.* Dec. 1906.)

Some of the values of the proper motion are:

A. G. Bonn	2″.827	in	82°.3
Küstner	2.858	in	81.9
Groombridge	2.888	in	82.5

9 *Ceti* (6.3...11.7)

R. A. 0^{h} 16^{m} 43^{s} Decl. — 12° 53′

1909.703	300°.32	185″.02
.725	300.03	184.96
.744	300.20	185.28
1909.72	300.18	185.09

No other measures of the small star. The proper motion of 9 *Ceti* is given:

Auwers	0".387	in	80°.7
Paris	0.389	in	82.5
Porter	0.385	in	81.0
Boss	0.397	in	80.0

DM (17°) 57 (9.6...10.9)

R. A. $0^h\ 17^m\ 11^s$ Decl. + 37° 55′

1909.573	4°.42	63".47
.589	4.55	63.48
.592	4.50	63.57
1909.58	4.49	63.51

By mistake Ball measured this star instead of the variable star which is 31^s *f*.

1877.59	4°.47	64".90	1n	Bl
1878.40	4.07	63.48	2n	Bl

Evidently little or no change.

R *Andromedae* (8.3...10.9)

R. A. $0^h\ 17^m\ 42^s$ Decl. + 37° 55′

1909.589	144°.32	84".69
.592	144.33	84.49
1909.59	144.32	84.59

The principal star DM (37°) 58, is variable and reddish. The measures by Ball of the last preceding star were intended for R *Andromedae*.

DM (30°) 89 (9.0...9.4)

R. A. $0^h\ 32^m\ 26^s$ Decl. + 30° 22′

Abetti (A. N. 4461) finds for this small star, near δ *Andromedae,* a proper motion of:

0".260 in 265°.6

There is no near suitable star for comparison. I have therefore connected it with the 9.3 m star DM (30°) 90:

1911.471	121°.20	233".97
.509	121.40	233.43
.545	121.57	233.51
1911.51	121.39	233.64

For comparison there is only the following:

1875	122°.3	227".7	A. G. Camb.
1895.8	122.3	232.5	Oxford (photo.)

For the photographic position, a scale value of 300".0 is applied to the difference of the measured coordinates. The two positions are not very accordant. The first compared with the measures would imply a proper motion of 0".19 in 270°, while from the other it is 0".25 in 230°.

54 *Piscium* (6.1...11.0)

R. A. $0^h\ 33^m\ 7^s$ Decl. + 20° 36′

1907.444	91°.25	121".76
.485	91.75	122.40
.502	91.63	122.00
.523	91.95	122.06
1907.49	91.64	122.05

The following are all the measures of this star:

1852.69	104°.28	98".51	1n	OΣ
1866.92	100.47	105.27	1n	OΣ
1907.49	91.64	122.05	4n	β

The proper motion of the principal star is:

Measures	0".611	in	231°.4
Auwers	0.601	in	232.7
Boss	0.596	in	231.0

DM (33°) 99 (8.5...9.5)

R. A. $0^h\ 37^m\ 7^s$ Decl. + 33° 12′

Prof. Abetti (A. N. 4453) has called attention to the proper motion of this 8.5 m star, which he finds to be:

0".480 in 315°.1

This is obtained by comparing it with a star of the same magnitude about $8^s.5$ following, and 9′.5 south. This star is DM (32°) 129. Both stars have good meridian positions, with an interval of nearly forty years, and the proper motion found results therefrom, assuming the comparison star to be practically fixed. There is a better and much nearer star for this purpose of only 9.5 m, and that is DM (32°) 120. It is safe to infer that a star of this magnitude has no motion which need be taken into account in the micrometer measures. The following measures connect the two:

DM (33°) 99 and (32°) 120

1910.895	181°.20	286".49
.931	181.18	286.05
.933	180.89	286.11
1910.92	181.09	286.22

The only positions for comparison are:

1855	179°	324"	DM
1894.7	181.8	292.0	Potsdam

From these it may be inferred that the star in question has some motion, in declination at least. Further measures with the micrometer, after a suitable interval of time, will settle the question, and give a definite value to the movement.

There is another DM star of about the same magnitude, 8.3 m, nearly preceding, and near enough in declination to be measured directly with the micrometer:

DM (33°) 99 and (33°) 96

	Δ RA	Δ Decl.	
1825	— $105^s.4$	+ 7"	Weisse
1855	105.2	54	DM
1894.7	104.7	39.8	Potsdam
1910.9	104.5	40.2	β

18 ***Ceti*** (6.0...12.3)

R. A. $0^{h}\,39^{m}\,27^{s}$ Decl. — 13° 32′

1909.703	232°.15	76″.97
.725	232.15	76.89
.744	232.77	77.17
1909.72	232.36	77.01

No other measures. The proper motion of 18 *Ceti* is given:

Auwers	0″.223	in	197°.9
Paris	0.216	in	190.9
Porter	0.210	in	198.3
Boss	0.200	in	191.4

ζ Andromedae (4.2...15.2)

R. A. $0^{h}\,40^{m}\,59^{s}$ Decl. + 23° 37′

A and B

1910.760	349°.1	28″.52
.777	349.1	28.42
.780	348.7	28.41
1910.77	349.0	28.45

A and C (13.5)

1910.760	229°.97	95″.83
.777	230.32	96.75
.780	229.13	96.71
1910.77	229.81	96.43

A and D (10.7)

1910.760	257°.66	168″.29
.777	257.80	167.71
.780	257.56	167.78
1910.77	257.67	167.93

No other measures of these stars. The proper motion of ζ *Andromedae* is given from meridian observations:

Auwers	0″.138	in	238°.7
Boss	0.129	in	231.8

DM (69°) 45 (7.5...10.0)

R. A. $0^{h}\,42^{m}\,0^{s}$ Decl. + 69° 47′

1907.750	296°.22	65″.10
.769	296.53	65.47
.772	296.27	65.24

The only other position of the 10 m star is:

1893.15	301°.17	62″.72	2n	Eng
1907.76	296.34	65.27	3n	β

The correction to the proper motion is small:

Measures	0″.408	in	54°.0
Stumpe	0.402	in	66.4
Greenwich	0.422	in	59.1

Lalande 1299 (5.9...10.5)

R. A. $0^{h}\,42^{m}\,5^{s}$ Decl. + 4° 40′

1909.703	200°.95	194″.61
.722	200.93	194.67
.725	200.93	194.88
1909.72	200.94	194.72

No other measures of this. The principal star has a large proper motion:

Newcomb	1″.353	in	147°.8
Porter	1.353	in	146.9
Boss	1.433	in	145.7

δ ***Piscium*** (4.6...13.2)

R. A. $0^{h}\,42^{m}\,27^{s}$ Decl. + 6° 56′

1911.663	15°.88	132″.53
.720	15.60	132.42
.736	15.17	131.76
.755	15.33	132.14
1911.72	15.50	132.21

No other measures. The proper motion is given:

Auwers	0″.069	in	126°.7
Newcomb	0.092	in	118.6
Boss	0.093	in	118.3

64 ***Piscium*** (5.3...12.7)

R. A. $0^{h}\,42^{m}\,40^{s}$ Decl. + 16° 24′

A and B

1911.720	322°.65	68″.97
.755	322.20	68.79
.775	322.32	69.12
1911.75	322.39	68.96

A and C (13.1)

1911.720	164°.82	78″.60
.755	164.58	79.41
.775	165.23	78.83
1911.75	164.88	78.95

No other measures. From meridian observations the proper motion is:

Auwers	0″.198	in	185°.0
Boss	0.204	in	185.7

Lalande 1532 (7.5...9.8)

R. A. $0^{h}\,48^{m}\,36^{s}$ Decl. + 23° 27′

1907.731	215°.85	61″.63
.750	215.62	61.78
.772	215.62	62.09
.788	215.93	61.86

The only other measure is:

1893.05	216°.57	65″.79	2n	Eng
1907.76	215.75	61.84	4n	β

Hence the proper motion of the principal star is:

0″.276 in 229°.1

Some of the results from meridian observations are:

Stumpe	0″.250	in	232°.0
Paris	0.242	in	229.0
Porter	0.286	in	235.9

DM (66°) 75 (8.8...11.8)

R. A. $0^h\ 50^m\ 24^s$ Decl. + 67° 3′

A and B

1909.496	226°.00	70″.63
.515	226.13	70.70
.570	226.18	70.53
1909.53	226.10	70.62

The principal star sometimes called red, but only reddish now. Change is doubtful.

1877.83	225°.44	71″.30	2n	Bl

A and DM (66°) 74

1909.570	341°.85	159″.84
.573	341.82	159.77
1909.57	341.83	159.80

The meridian observations give this relation:

1874.5	341°.7	161″.4	A. G. Chris

The apparent change in the distance of this 8.8 m star is not likely to be real.

25 *Ceti* (5.9...12.3)

R. A. $0^h\ 56^m\ 59^s$ Decl. — 5° 29′

1911.755	241°.07	109″.37
.775	241.17	108.44
.777	241.10	108.84
1911.77	241.08	108.88

No other measures. The proper motion is:

Auwers	0″.163	in	236°.5
Boss	0.152	in	228.3

μ *Cassiopeiae* (5...10.8)

R. A. $1^h\ 0^m\ 22^s$ Decl. + 54° 20′

A and B

1907.482	217°.93	187″.32
.485	217.58	187.35
.502	217.85	187.49
.523	217.85	187.29
1910.493	221.22	190.43
.529	221.33	190.60
.570	221.20	190.55

For comparison we have:

1855.34	164°.26	238″.89	16n	OΣ
1856.88	165.30	235.65	4n	OΣ
1881.93	188.15	190.29	2n	OΣ
1907.50	217.80	187.36	4n	β
1910.53	221.25	190.53	3n	β

From the large number of nights in the first position by OΣ, the resulting proper motion should have a high degree of accuracy. As would be expected in a star moving at this rate, the correction is small:

Measures	3″.789	in	114°.5
Auwers	3.757	in	115.0
Newcomb	3.759	in	114.4
Boss	3.759	in	114.5

Other small stars in the field are:

AC	1907.463	145°.30	205″.80	
Cc	1907.463	113.80	4.19	10.8...12.5
A*a*	1907.463	144.78	87.71	...12

80 *Piscium* (6.0...9.8)

R. A. $1^h\ 2^m\ 11^s$ Decl. + 5° 1′

1907.750	128°.83	159″.72
.769	128.96	159.12
.772	129.15	159.06

The small star is DM (4°) 192. These are all the measures:

1853.93	132°.72	152″.22	1n	OΣ
1868.76	131.68	153.84	1n	OΣ
1882.69	130.59	155.82	1n	OΣ
1907.76	128.98	159.30	3n	β

These positions give for the proper motion of the large star:

0″.230 in 255°.8

This motion from meridian positions is larger:

Auwers	0″.339	in	239°.2
Porter	0.350	in	240.7
Newcomb	0.318	in	237.5
Boss	0.327	in	236.3

It is not probable that the small star, 9.5 m in DM, has any sensible motion. To determine this hereafter, I have measured a third star:

A and *a* (12.5)

1907.769	286°.43	86″.20
.772	286.33	86.04
1907.77	286.38	86.12

η *Ceti* (3.5...10.2)

R. A. $1^h\ 2^m\ 33^s$ Decl.— 10° 49′

1907.636	304°.82	233″.57
.638	304.45	233.55
.673	304.45	233.46

The only measure for comparison is:

1879.88	304°.50	225″.22	2n	β^s
1907.65	304.57	233.53	3n	β

Giving for the proper motion of A:

Measures	0″.299	in	126°.4
Auwers	0.219	in	125.5
Newcomb	0.246	in	120.7
Boss	0.247	in	122.6

θ *Cassiopeiae* (4.6...10.5)

R. A. $1^h\ 3^m\ 48^s$ Decl. + 54° 31′

1907.463	134°.70	145″.55
.482	134.87	145.50
.485	134.75	145.79

The several measures are:

1853.50	131°.80	154″.67	2n	OΣ
1881.15	133.13	149.64	1n	OΣ
1907.48	134.77	145.61	3n	β

The proper motion of θ *Cassiopeiae* is:

Measures	0″.221	in	92°.7
Auwers	0.207	in	96.7
Boss	0.230	in	94.5

Lalande 2062 (7.7...9.4)

R. A. $1^h\,3^m\,52^s$ Decl. + 42° 18′

A and B

1907.791	298°.18	154″.16
7.807	298.28	153.95
7.848	298.25	154.46
8.102	298.35	154.14

B and C (9.4...12.0)

1907.848	224°.27	34″.55
8.102	224.40	34.54
1907.97	224.33	34.54

These are all the measures of AB:

1893.12	297°.11	155″.34	2n	Eng
1907.89	298.26	154.15	4n	β

From which the proper motion of the larger star is:

0″.225 in 228°.6

The meridian values are:

Stumpe	0″.221	in	200°.3
Paris	0.228	in	208.8
Porter	0.261	in	216.5

38 *Ceti* (6.0...12.3)

R. A. $1^h\,8^m\,42^s$ Decl. — 1° 37′

A and B

1909.570	275°.85	114″.00
.627	275.45	114.40
.649	275.32	113.86
1909.61	275.54	114.09

No other measures of the small star. The proper motion of 38 *Ceti* is given:

Auwers	0″.239	in	336°.8
Paris	0.204	in	352.0
Porter	0.227	in	340.7
Boss	0.221	in	353.4

One of Swift's nebulae (Dreyer 442) is in the field *sp*. It is too faint and diffused for very accurate bisection:

A and neb.

1909.570	226°.8	219″.0
.627	227.3	216.6
1909.60	227.0	217.8

Oxford (Z 26°) 3131 (9.3 m)

R. A. $1^h\,11^m\,12^s.63$ Decl. + 25° 55′ 11″.0

This is the 9.2 m star, DM (25°) 206. The place given above, for 1900, is from an Oxford astrographic plate taken 1907.84. The proper motion is deduced:

0″.274 in 77°.5

There is no near small star for micrometer comparison. The nearest A. G. star is 7.7 m, some distance following.

A and DM (25°) 211

1910.5	Δ R. A. + $87^s.7$	Δ Decl. + 16″.6	β
1900.	88.1	19.5	A. G.—Oxf.

Lalande 2387 (8.5...10.2)

R. A. $1^h\,13^m\,1^s$ Decl. — 9° 33′

1907.865	59°.13	162″.00
8.000	59.23	162.64
8.079	59.38	162.50

The only measures are:

1893.94	60°.27	157″.04	2n	Eng
1907.98	59.25	162.38	3n	β

Giving for the proper motion:

0″.431 in 211°.7

The meridian value is probably too large:

Paris	0″.585	in	206°.2
Porter	0.589	in	212.5

δ *Cassiopeiae* (3.0...11.7)

R. A. $1^h\,17^m\,59^s$ Decl. + 59° 37′

1909.515	67°.17	136″.12
.570	67.18	136.04
.573	67.18	135.88
1909.55	67.18	136.01

No other measures. There is a faint star near B. The proper motion of the large star is given from the catalogue places:

Auwers	0″.295	in	101°.0
Newcomb	0.309	in	96.8
Groombridge	0.310	in	98.9
Boss	0.324	in	98.2

Lalande 2682 (8.2...9.1)

R. A. $1^h\,22^m\,30^s$ Decl. + 21° 6′

A and B

1907.731	77°.10	86″.36
.750	77.05	86.45
.772	76.62	86.33
1907.75	76.92	86.38

B and C (= Ho 9)

1907.731	94°.5	3″.04
.750	94.1	2.98
.772	92.6	3.02
1907.75	93.7	3.01

A and D (10.3)

1907.788	184°.40	82″.15
.791	184.75	81.94
.845	184.58	82.16
1907.81	184.58	82.08

For A and B we have:

1893.05	79°.95	94″.27	2n	Eng
1907.75	76.92	86.38	3n	β

These give for the corrected proper motion of A:

0″.627 in 109°.7

This motion in the star catalogues appears to be too small:

Stumpe	0″.489	in	110°.7
Paris	0.519	in	110.4
Porter	0.473	in	111.7

That B has no motion seems to be certain from the several measures of BC during the past 25 years. In further verification of this, I have measured a third small star D.

Lalande 2701 (8.5...9.0)

R. A. $1^h\ 22^m\ 59^s$ Decl. + 30° 23′

1907.750	348°.18	184″.35
.788	348.15	184.35
.810	348.36	184.23

These stars are DM (30°) 233 and 232, and the magnitudes 8.1 and 9.3.

1892.12	349°.30	183″.95	2n	Eng
1907.78	348.23	184.31	3n	β

These positions give for the proper motion of A:

Measures	0″.220	in	95°.3
Paris	0.248	in	90.0
Porter	0.220	in	96.0

A similar pair, 15^s *p* and 6′ *s*, was at first measured for the other:

DM (30°) 230 and 229 (8.7...9.2)

1907.772	250°.78	90″.17
.788	250.50	89.91
.791	250.75	89.96
1907.78	250.68	90.01

No other measures. The DM places give a larger distance.

μ ***Piscium*** (4.5...11.0)

R. A. $1^h\ 23^m\ 54^s$ Decl. + 5° 31′

1907.769	301°.63	182″.17
.772	301.63	182.66
.788	301.53	182.57

Rejecting the single measure by OΣ, marked uncertain, we have:

1883.81	302°.65	176″.72	1n	HΣ
1907.77	301.60	182.47	3n	β

Giving for the proper motion of the principal star:

0″.279 in 92°.3

The meridian values are:

Auwers	0″.266	in	96°.7
Newcomb	0.298	in	95.2
Porter	0.277	in	97.7
Boss	0.293	in	98.6

B has a small 11.0 m companion not previously measured.

B and C (10...11)

1907.769	307°.77	27″.24
.772	307.20	27.30
.788	306.85	27.50
1907.77	307.27	27.35

DM (59°) 274 (9.0...8.5)

R. A. $1^h\ 25^m\ 32^s$ Decl. + 60° 0′

A and B

1909.515	187°.13	60″.00
.570	187.00	59.74
.573	186.58	59.68
1909.55	186.90	59.81

A and C (8.2)

1909.515	125°.35	144″.40
.570	125.35	144.51
.573	125.32	144.73
1909.59	125.34	144.55

The primary is reddish. B and C are respectively DM (59°) 273 and 276. In A. G. Hels. the DM numbers 274 and 273 seem to be transposed. With this correction we have the following for comparison:

A and B

1876.8	185°.5	60″.0		A. G. Hels.
1878.83	186.52	60.28	2n	Bl

A and C

1876.8	125°.6	143″.4		A. G. Hels.
1878.83	125.52	144.11	2n	Bl

These are among the principal stars of the cluster *h* 126 (M 103).

υ **50 *Andromedae*** (4.3...12.7)

R. A. $1^h\ 29^m\ 45^s$ Decl. + 40° 48′

1909.493	128°.50	114″.21
.512	128.30	113.68
.515	128.50	114.11
1909.51	128.43	114.00

No other measures of this. The proper motion of the bright star is given:

Auwers	0″.419	in	206°.8
Porter	0.409	in	206.3
Boss	0.419	in	205.3

DM (49°) 445 (7.8...11.3)

R. A. $1^h\ 36^m\ 17^s$ Decl. + 49° 59′

1909.570	40°.32	107″.43
.573	40.19	107.37
.589	40.10	107.24
1909.58	40.20	107.35

The larger star is reddish. The other measures are uncertain in distance; probably unchanged.

1879.15	40°.27	106″.37	1n	Bl
.64	40.13	104.78	1n	Bl
.64	40.00	106.01	1n	Bl

τ *Ceti* (3.5...13.6)

R. A. 1ʰ 38ᵐ 30ˢ Decl. — 16° 34′

1911.813	243°.27	110″.93
.870	243.87	110.69
.942	243.00	110.63
1911.87	243.38	110.75

No other measures. The principal star has a large proper motion:

Auwers	1″.950	in	296°.1
Newcomb	1.926	in	296.4
Boss	1.920	in	296.5

The small star will be within range of the micrometer for comparison for a long time.

Lalande 3153 (7.2...11.8)

R. A. 1ʰ 36ᵐ 24ˢ Decl. — 18° 29′

1911.755	292°.03	85″.46
.775	292.60	85.69
.813	292.63	85.02
1911.78	292.41	85.39

No other measures. The proper motion of A is given:

Porter	0″.541	in	90°.0

Piazzi I. 159 (6.0...9.5)

R. A. 1ʰ 39ᵐ 5ˢ Decl. + 63° 16′

1907.731	137°.75	93″.47
.750	137.50	93.32
.772	137.28	93.64

The small star is DM (63°) 241. The measures are:

1892.21	135°.13	102″.70	2n	Eng
1907.75	137.51	93.48	3n	β

The correction to the proper motion is small:

Measures	0″.649	in	112°.5
Greenwich	0.626	in	111.3
Porter	0.636	in	113.0
Boss	0.634	in	111.8

53 *Ceti* (4.7...6.1)

R. A. 1ʰ 43ᵐ 41ˢ Decl. — 11° 17′

1908.652	249°.93	183″.54
.689	250.18	183.98
.692	250.15	184.09

It is evident from the following positions that these stars are relatively fixed, and that they have a common proper motion:

1888.02	250°.03	183″.88	2n	Eng
1894.88	250.20	183.88	2n	Eng
1908.68	250.09	183.87	3n	β

There is no third star near enough to connect with either for an independent determination of the movement of the large stars. The proper motion of 53 *Ceti* is given:

Auwers	0″.212	in	246°.4
Porter	0.183	in	244.1
Boss	0.177	in	243.5

ζ *Ceti* (3.5...10.0)

R. A. 1ʰ 45ᵐ 32ˢ Decl. — 10° 55′

1907.636	41°.15	187″.17
.638	40.90	186.88
.673	41.08	186.89

The small star is SD (11°) 360. The only measures are:

1879.88	40°.70	185″.67	2n	β^3
1907.65	41.04	186.98	3n	β

The proper motion is so small that a longer interval is required to give a reliable value. From the measures we have:

0″.062 in 260°.2

This is a larger and reversed motion in R. A. From meridian observations:

Auwers (Fund.)	0″.028	in	171°.0
Auwers (A. N. 3508)	0.029	in	149.5
Newcomb	0.040	in	132.8
Boss	0.049	in	131.0

The companion should be measured again some years hence. Unfortunately there is no other star near enough to be connected with either with the micrometer.

α *Trianguli* (3.6...12.9)

R. A. 1ʰ 46ᵐ 15ˢ Decl. + 29° 0′

A and B

1909.512	308°.80	84″.96
.570	308.75	84.94
.589	308.85	85.11
1909.56	308.80	85.00

A and C (12.2)

1909.589	182°.28	222″.69
.592	182.37	221.98
1909.59	182.32	222.33

As the early measures are on one night for AB, and single distances on two nights of the other, further observations should be made hereafter.

AB	1879.59	304°.1	80″.62	1n	β^3
AC	1879.67	182.2	228.30	3n	β^3

From these positions we have for the proper motion of α *Trianguli:*

Measures	0″.226	in	182°.3
Auwers	0.226	in	180.3
Newcomb	0.232	in	175.1
Boss	0.233	in	175.8

Lalande 3621 (7.0...9.5)

R. A. 1ʰ 52ᵐ 5ˢ Decl. + 32° 38′

1907.845	138°.50	131″.18
7.964	138.77	131.18
8.102	138.85	131.14

For comparison we have:

1893.12	139°.15	136″.59	2n	Eng
1907.97	138.71	131.17	3n	β

The corrected proper motion is less:

0″.372 in 149°.5

It is given from meridian positions:

Stumpe	0″.439	in	151°.6
Porter	0.428	in	153.2
Paris	0.454	in	146.6

It is extremely improbable that the small star has any sensible motion. To make this certain hereafter, I have measured a third 12.2 m star:

A and *a*

1907.964	30°.65	86″.70
8.102	30.90	86.60
1908.03	30.77	86.65

DM (54°) 444 (7.9...9.3)

R. A. $1^h\ 55^m\ 7^s$ Decl. $+ 54°\ 39'$

1909.573	176°.62	221″.12
.592	176.68	221.15
.647	176.10	220.77
1909.60	176.47	221.01

This has been measured as follows:

1879.40	176°.96	220″.17	2n	Bl

The principal star is reddish. The other is DM (54°) 445. The apparent change is probably not real, since the separating distance is too large for the most accurate measures.

Lalande 3962

R. A. $2^h\ 3^m\ 25^s$ Decl. $+ 29°\ 15'$

A and B (8.5...11.7)

1907.791	170°.20	103″.89
.807	169.58	103.58
.865	169.90	103.69
1907.82	169.89	103.72

A and C (11.2)

1907.788	2°.10	158″.12
.791	1.97	158.22
.865	2.20	158.82
1908.81	2.09	158.39

A and D (10.4)

1907.791	239°.93	213″.69	Single dist.
.865	240.20	213.18	" "
1907.83	240.06	213.43	

There are no other measures of these stars. The observation in Engelhardt ascribed to the Lalande star is given:

1893.99	327°.43	80″.09	3n	7.0...9.9

I could not identify this with any star in the vicinity.

The proper motion of L 3962 is given:

Stumpe	0″.361	in	123°.5
Paris	0.366	in	122.2
Porter	0.356	in	128.7

6 *Persei* (5.5...10.0)

R. A. $2^h\ 5^m\ 38^s$ Decl. $+ 50°\ 30'$

1907.731	70°.43	131″.18
.750	70.50	131.05
.772	70.38	131.19

We have the following measures of the small star:

1853.71	75°.82	146″.58	3n	OΣ
1873.14	74.10	140.40	1n	OΣ
1881.14	73.18	139.56	1n	OΣ
1907.75	70.44	131.14	3n	β

Therefore the proper motion of the large star is:

0″.373 in 114°.0

From meridian observations:

Auwers	0.374	in	117°.5
Greenwich	0.357	in	115.4
Newcomb	0.388	in	115.4
Boss	0.386	in	115.8

DM (67°) 191 (7.8...9.3)

R. A. $2^h\ 5^m\ 54^s$ Decl. $+ 67°\ 7'$

1907.731	104°.40	42″.38
.750	104.13	42.48
.772	104.25	42.55

The small star is DM (66°) 193. The proper motion is deduced from the following positions:

1875.6	108°.80	62″.40		A. G. Chris.
1892.21	106.62	52.03	2n	Eng
1907.75	104.26	42.47	3n	β

These give for the motion of A:

0″.626 in 118°.3

From meridian positions:

Porter	0″.567	in	122°.5
A. G. Chris.	0.560	in	124.1

DM (44°) 456 (8.6...10.6)

R. A. $2^h\ 10^m\ 32^s$ Decl. $+ 44°\ 39'$

1908.862	35°.38	98″.80
.882	35.03	98.68
.884	35.13	98.72
1908.87	35.18	98.73

Sometimes catalogued as a red star, but not red now. Apparently unchanged.

1879.15	34°.90	99″.00	1n	Bl
1879.64	34.50	98.16	1n	Bl
1894.92	35.20	98.86		Donner

The last position is photographic.

DM (49°) 628 (7.2...10.7)

R. A. $2^h\ 11^m\ 19^s$ Decl. $+ 49°\ 35'$

1908.845	354°.07	136″.83
.862	353.85	136.86
.882	353.75	137.25
1908.86	353.89	136.98

Apparently unchanged. The proper motion, if any, is very small.

1879.40	353°.85	136″.35	2n	Bl

S *Persei* (9.2...11.0)

R. A. $2^h 14^m 15^s$ Decl. + 58° 2′

1908.862	19°.88	68″.87
.882	19.75	69.14
.884	19.67	69.11
1908.87	19.77	69.04

The principal star is variable and reddish. The other measures do not agree in distance, and the apparent change must be verified.

1880.21	19°.75	68″.55	1n	Bl
1880.59	19.38	67.88	1n	Bl

Piazzi II. 61 (6.3...11.8)

R. A. $2^h 15^m 23^s$ Decl. + 40° 51′

1909.573	1°.13	55″.95
.589	0.95	56.01
.592	1.13	56.19
1909.58	1.07	56.05

The earlier measures give:

1880.41	358°.5	53″.31	2n	β^3

The proper motion of the principal star therefore is:

0″.126 in 228°.4

This movement has been given:

Groombridge	0″.120	in	228°.9
Gr. 10-year	0.143	in	212.7
Boss	0.127	in	222.5

There is a 7.6 m star in a low-power field:

1874.	6°.4	291″.5		A. G. Bonn
1909.59	6.95	295.46	1n	β

65 *Andromedae* (4.8...12.8)

R. A. $2^h 16^m 37^s$ Decl. + 49° 44′

A and B

1908.845	303°.10	47″.67
.862	303.40	47.97
.882	303.00	47.99
1908.86	303.17	47.88

A and C (10.5)

1908.845	307°.37	192″.14
.862	306.88	191.92
.882	306.88	191.82
1908.86	307.04	191.96

The proper motion of the large star is small:

Auwers	0″.024	in	153°.1
Boss	0.031	in	121.5

No other measures of B. There appears to be a large error in one of the former distances of C:

1879.16	306°.73	192″.14	1n	Bl
1879.64	306.57	190.75	1n	Bl

77 *Ceti* (6.1...12.8)

R. A. $2^h 28^m 47^s$ Decl. — 8° 23′

1911.663	47°.05	95″.35
.720	47.35	95.18
.736	47.25	94.64
1911.71	47.22	95.06

No other measures.

The proper motion of 77 *Ceti* from meridian observations is given:

Auwers	0″.091	in	140°.9
Boss	0.090	in	136.2

80 *Ceti* (5.9...13.5)

R. A. $2^h 30^m 6^s$ Decl. — 8° 21′

A and B

1911.663	123°.18	117″.06
.720	123.48	117.52
1911.69	123.33	117.29

A and C (9.6)

1911.644	189°.26	146″.07
.663	189.23	146.40
.720	188.98	146.32
1911.67	189.16	146.26

C is SD (8°) 488. From meridian positions we have for AC:

1900	189°.2	147″.2	A. G. Wein-Ott.

The proper motion of 80 *Ceti* is given:

Auwers	0″.087	in	222°.8
Boss	0.076	in	209.3

DM (57°) 651 (6.2...9.0)

R. A. $2^h 42^m 46^s$ Decl. + 57° 49′

1910.644	147°.03	193″.19
.666	147.07	193.22
.678	147.10	193.44
1910.66	147.07	193.28

I do not find any proper motion from meridian positions for the large star. For comparison we have:

1875.	147°.8	191″.4		A. G. Hels.
1879.38	147.3	192.19	2n	Bl

16 *Persei* (4.5...9.2)

R. A. $2^h 43^m 0^s$ Decl. + 37° 49′

1908.573	145°.53	252″.28
.597	145.88	252.13
.613	145.60	252.32
1908.59	145.67	252.24

The other measures are the following:

1857.41	144°.20	262″.96	1n	OΣ
1881.16	144.63	257.61	1n	OΣ

These positions compared with the recent measures give for the corrected proper motion of the principal star:

0″.251 in 108°.8

This has been given from transit observations:

Stumpe	0″.205	in	107°.6
Porter	0.200	in	116.7
Auwers	0.204	in	108.2
Boss	0.213	in	119.5

As a further check on the corrected value, a nearer star 13 m is connected:

1911.625	121°.10	97″.24
.644	121.16	97.04
.663	121.46	97.13
1911.64	121.24	97.14

Anonymous

R. A. 2^h 45^m 54^s Decl. + 22° 37′ 8″

M. Puiseux, of the Paris Observatory, has called attention to a 10.4 m star apparently having a large proper motion (*Bull. Ast.*, xxvi, 416). This was noted on a photographic plate made November 25, 1908. Comparing this with a previous plate, he found for the proper motion of the small star:

0″.708 in 241°.7

He gives the place (1900) as above.

The photographic print shows three stars, the nearest two exceedingly faint, and very much fainter than the smallest stars usually visible on the astrographic plates. My measures of these stars are:

A and B (11.1...13.2)

1910.589	175°.68	96″.73
.605	176.26	96.93
.666	176.23	95.84
.678	176.37	97.38

A and C (13.3)

1910.589	113°.82	101″.07
.605	113.41	101.78
.666	113.03	101.78
.678	113.73	101.12

A and D (12.1)

1910.091	301°.00	162″.09
.570	301.03	162.09
.586	301.05	161.85
.589	301.00	161.85

M. Puiseux gives the photographic relative positions of these stars:

AB	1908.90	176°.60	96″.37		Photo.
	1910.63	176.13	96.72	4n	β
AC	1908.90	114.20	100.34		Photo.
	1910.63	113.50	101.44	4n	β
AD	1908.90	301.10	161.69		Photo.
	1910.46	301.03	161.97	4n	β

From these positions we have for the apparent motion of A:

AB	R. A. — 0″.468	Decl. + 0″.185
AC	— 0.873	— 0.393
AD	+ 0.218	+ 0.013

When the errors probable in the photographic and the micrometrical results are considered, it is obvious that no high degree of accuracy for the proper motion, if any exists, could be expected from positions having a time interval of only a little more than one and a half years. The most distant star is discordant when compared with the other two, and must therefore be rejected if use is made of the others. From the mean of AB and AC we have for the proper motion of A:

0″.678 in 261°.2

The smaller apparent change in AD may be due to errors of observation in all the measures, or to a possible proper motion in that star, although this is to the last degree improbable. To settle this question hereafter, I have connected this star with others shown on the print:

D and E (10.0)

1910.701	289°.75	101″.10
.703	289.78	101.25
.739	289.97	100.58
.742	290.01	100.51

E and F (12.5)

1910.760	219°.60	157″.93
.780	219.51	158.21
.818	219.30	158.09

E and G (12.5)

1910.818	250°.58	215″.76
.838	250.48	215.65

Professor Frederick Slocum has kindly measured the print referred to, with all possible accuracy, for the positions of these stars. The comparisons are as follows:

DE	1908.90	290°.73	101″.29		Photo.
	1910.72	289.88	100.86	4n	β
EF	1908.90	219.71	158.27		Photo.
	1910.78	219.47	158.08	3n	β
EG	1908.90	250.55	215.52		Photo.
	1910.83	250.53	215.70	2n	β

From these measures it would seem probable that D has some proper motion, since there is no evidence of change in EF or EG. The two positions of DE imply a movement of D of 0″.87 in 355°.6.

It would appear that, for all practical purposes, measures from a print can be safely used in lieu of those from the original plate. The print-measures of the other two stars are:

AB	1908.90	176°.2	96″.63
AC	1908.90	114.0	100.27

A careful re-measurement of these stars with the micrometer a few years hence will give a substantially correct value of the movement of both stars, if the apparent change is real.

Lalande 5273 (5.8...13.3)

R. A. 2^h 46^m 27^s Decl. + 61° 2′

A and B

1911.625	255°.27	50″.75
.644	256.10	50.63
.755	256.17	50.95
1911.67	255.85	50.78

A and C (11.3)

1911.625	43°.27	91″.37
.644	43.23	91.51
.755	43.40	91.60
1911.67	43.30	91.49

No other measures. The proper motion of the principal star is given:

Argelander	0″.172	in	87°.0
Boss	0.175	in	81.1
Porter	0.160	in	90.0

DM (63°) 369 (6.5...9.9)

R. A. $2^h\,46^m\,31^s$ Decl. + 63° 50′

1910.644	129°.33	115″.60
.666	129.40	115.89
.678	129.07	116.50
1910.66	129.27	116.00

No proper motion given the large star. It is decidedly reddish. The only other measure is:

1879.40	129°.7	115″.20	2n	Bl

Lalande 5586 (7.1...9.2)

R. A. $2^h\,56^m\,2^s$ Decl. + 35° 58′

1907.788	265°.03	84″.28
.807	265.10	84.07
.848	265.30	84.45
1907.81	265.14	84.27

These stars are DM (35°) 616 and 615. In the first instance this was measured by mistake for Lalande 5712 which is about 4^m *f*. There are no other direct measures, but from the meridian positions there would seem to be considerable proper motion in R. A. in one of the stars.

1889.2	265°.1	81″.2	A. G. Lund

This is confirmed by the DM places which give 77″.7 for Δ RA.

On one occasion the principal star was thought to have a very faint companion 6″ or 8″ distant on the *f* side, but the conditions were not suitable to verify it later.

Lalande 5712 (7.0...8.4)

R. A. $3^h\,0^m\,3^s$ Decl. + 36° 10′

1907.750	245°.10	117″.82
.807	244.83	117.90
.810	245.26	117.92

The mean results are:

1893.12	243°.15	116″.22	2n	Eng
1907.79	245.06	117.88	3n	β

It would be unsafe to assume that a comparison star of this brightness had no motion of its own. In this instance it is probably fixed. The several values of the motion of A are:

Measures	0″.290	in	131°.1
Paris	0.373	in	124.5
Porter	0.338	in	131.9

Both stars are in A. G. Lund. The smaller is D M (36°) 631.

ι ***Persei*** (4.2...12.4)

R. A. $3^h\,1^m\,5^s$ Decl. + 49° 9′

1911.644	131°.73	146″.24
.663	132.42	146.09
.720	131.83	146.12
1911.67	131.99	146.15

No other measures. The principal star has a large proper motion:

Auwers	1″.253	in	93°.8
Boss	1.268	in	93.6
Newcomb	1.308	in	94.3

ω ***Persei*** (4.7...11.0)

R. A. $3^h\,3^m\,33^s$ Decl. + 39° 9′

1908.845	111°.63	177″.22
.862	111.05	177.55
.882	111.13	177.62
1908.86	111.27	177.46

The only other positions are:

1879.40	110°.80	176″.50	2n	Bl
1896.99	112.05	178.13	2n	Donner

The last position is photographic.

The proper motion of ω *Persei* is small:

Auwers	0″.039	in	300°.7
Boss	0.022	in	277.7

DM (47°) 779 (6.9...10.8)

R. A. $3^h\,4^m\,8^s$ Decl. + 47° 17′

A and D

1908.884	294°.68	202″.08
.898	295.02	202.17
.920	294.99	201.95

For comparison we have the following:

1880.41	294°.14	198″.64	2n	Bl
1908.90	294.90	202.07	3n	β

If the early position is correct, one of these stars has a proper motion of about 0″.12, but this must be verified by later measures. I have been unable to find any other positions of the small star photographic or otherwise. The star catalogues give no proper motion to the large star. This is sometimes listed as a red star.

I have added two new and near companions to the principal star, the first of which is very faint and difficult.

A and B (14.8)

1908.884	3°.4	7″.47
.920	7.3	7.45
.974	9.8	7.15
1908.93	6.8	7.36

A and C (13.2)

1908.884	176°.6	28″.06
.920	175.5	28.15
.939	176.2	27.78
1908.93	176.1	28.00

There is a faint star near D, a re-measurement of which will show whether there is any movement in D.

D and *d* (13.5)

1908.920	96°.0	19″.74
.939	91.7	19.98
1908.93	93.8	19.86

Lalande 5922 (7.3...7.8)

R. A. $3^h\ 5^m\ 6^s$ Decl. — 11° 35′

1907.788	56°.20	143″.64
.791	56.03	143.88
.845	56.27	143.52

The only direct measures are:

1894.03	56°.80	144″.17	2n	Eng
1907.81	56.17	143.68	3n	β

The comparison star might well have some proper motion so far as magnitude is concerned. In this instance the motion, if any, is small. For the proper motion of A:

Measures	0″.121	in	129°.5
Stumpe	0.180	in	129.2
Paris	0.203	in	130.1
Porter	0.165	in	125.9

The relation of these stars in some of the catalogues is not consistent with the micrometer positions, nor with the recognised proper motion.

	Δ RA	Δ Decl.	
1825.	130″.0	70″.5	Weisse
1890.0	118.9	77.1	Cin. 13
1894.0	120.64	78.94	Eng
1907.8	119.35	80.00	β

To show hereafter whether or not B has any proper motion, I have connected it with a 11.5 m star.

B and C

1907.865	155°.90	86″.14
.974	154.50	86.55
1907.92	155.20	86.34

Lalande 5993 (8.5...8.5)

R. A. $3^h\ 8^m\ 24^s$ Decl. + 15° 51′

A and B

1907.848	181°.03	175″.97
.865	180.83	175.66
.974	180.65	175.25
1907.89	180.84	175.63

A and C (11.8)

1907.848	235°.75	181″.58
.865	235.87	180.93
.974	235.60	180.28
1907.89	235.74	180.93

B and C

1907.848	296°.45	165″.19
.865	296.80	164.76
.974	296.40	164.87
1907.89	296.55	164.94

B is Lalande 5994, and from meridian observations, has no proper motion. The only measures are:

1894.03	180°.01	175″.92	2n	Eng
1907.89	180.84	175.63	3n	β

These positions give for the proper motion of A:

0″.164 in 97°.9

If these measures are combined with the meridian positions in A. G. Berlin and Cin. 13, the proper motion is:

0″.184 in 111°.6

Some of the values from catalogue places are:

Stumpe	0″.294	in	147°.0
Paris	0.195	in	90.0
A. G. Berlin	0.139	in	126.8

As a further contribution to this matter in the future, I have connected each with a faint star which it is practically certain has no sensible proper motion.

Bradley 448 (4.8...12.5)

R. A. $3^h\ 9^m\ 27^s$ Decl. + 65° 13′

1911.931	97°.60	122″.08
.942	57.53	121.50
.950	57.63	120.97
1911.94	57.59	121.52

If the large star has any proper motion, it is very small and very uncertain.

Auwers	0″.028	in	244°.9
Gr. (1900)	0.006	in	348.2
Boss	0.012	in	293.9

ϰ ***Ceti*** (5.2...9.2)

R. A. $3^h\ 13^m\ 4^s$ Decl. + 2° 56′

1909.071	156°.90	269″.07
.627	157.25	269.18
.630	157.10	267.83
.649	156.95	268.62
1909.49	157.05	268.68

For comparison we have the following measures:

1853.26	153°.22	271″.57	3n	OΣ
1884.10	155.37	270.13	2n	HΣ

From these positions the apparent proper motion of ϰ *Ceti* is:

0″.323 in 74°.4

The motion from meridian observations seems to be too small. It is not probable that the small star, DM (2°) 521, has any sensible movement. It is given in A. G. Albany, Schjellerup and other star catalogues.

Auwers	0″.269	in	65°.9
Newcomb	0.288	in	70.3
Porter	0.277	in	69.3
Boss	0.281	in	70.5

For future use in this connection, I have connected a third small star:

B and C (11.5)

1909.706	272°.25	215″.14
.725	272.53	215.09
1909.71	272.39	215.11

α **Persei** (2.2...12.2)

R. A. 3h 15m 45s Decl. + 49° 26′

1909.573	195°.90	167″.01
.589	195.98	166.99
.627	196.02	166.88
1909.59	195.97	166.96

The only other measures are:

1879.54	195°.5	166″.05	2n	β³

From these positions we have for the proper motion of α *Persei:*

0″.055 in 71°.1

The meridian observations leave the amount and direction of this motion very uncertain.

Auwers (F. C.)	0″.064	in	166°.7
Auwers (Cor'd)	0.011	in	105.1
Newcomb (Stand.)	0.045	in	138.0
Newcomb (Fund.)	0.040	in	133.9
Groombridge	0.029	in	146.8
Boss	0.039	in	135.7

DM (42°) 787 (7.5...12.8)

R. A. 3h 27m 27s Decl. + 42° 29′

A and B

1909.802	191°.00	54″.10
.818	191.40	53.89
.838	191.70	53.84
1909.82	191.37	53.94

No other measures of the small star. The proper motion of the principal star, Groombridge 706, is given:

A. G. Bonn	0″.179	in	137°.6
Porter	0.174	in	137.5
Groombridge	0.213	in	135.6

For further comparison I have connected a star 8.3 m closely following:

A and Lalande 6548

1909.802	93°.67	193″.75
.818	93.93	193.42
.838	93.70	193.66
1909.82	93.77	193.61

From meridian observations we have:

1878	94°.8	199″.0	A. G. Bonn

These positions give as nearly the same proper motion of A as could be expected from the data:

0″.203 in 128°.0

Recent direct measures are:

1907.26	93°.75	194″.40	2n	Hertzsprung

DM (62°) 596 (Var...9.2)

R. A. 3h 31m 30s Decl. + 62° 15′

1910.644	348°.80	208″.09
.666	348.90	207.84
.678	348.80	207.83
1910.66	348.83	207.92

B is DM (62°) 594. The principal star is reddish. Probably unchanged.

1879.42	348°.64	208″.33	2n	Bl

δ **Persei** (3.3...10.6)

R. A. 3h 34m 24s Decl. + 47° 24′

1907.578	312°.53	99″.22
.581	312.40	99.08
.657	312.62	99.09
1907.60	312.52	99.13

The only other measure of this star is:

1879.32	312°.60	97″.44	3n	β³

From these positions we have for the proper motion of δ *Persei:*

0″.060 in 127°.9

From meridian observations:

Auwers	0″.039	in	161°.8
Newcomb	0.051	in	135.3
Boss	0.046	in	135.5

Lalande 6772 (7.5...10.5)

R. A. 3h 35m 35s Decl. + 42° 14′

A and B

1907.791	280°.57	47″.56
.807	281.25	47.13
.810	281.16	46.97
.845	281.50	47.24

B and C (12.5)

1907.845	184°.45	55″.51
7.964	184.62	54.97
8.000	184.50	55.69
1907.94	184.52	55.39

There are no other measures of the third star. For AB we have the following:

1893.21	277°.57	41″.69	3n	Eng
1907.81	281.12	47.22	4n	β

The corrected proper motion of the principal star is therefore:

0″.427 in 126°.6

Some of the former values are:

Stumpe	0″.482	in	122°.9
Paris	0.534	in	123.5
Porter	0.406	in	124.9

Bradley 536 (7.0...9.5)

R. A. 3ʰ 46ᵐ 3ˢ Decl. — 1° 31′

1907.636	154°.10	95″.56
.638	153.68	95.55
.657	153.65	95.60

The measures are obviously inconsistent and nothing can be safely inferred as to the real relative motion if any.

1886.52	153°.57	95″.18	2n	Eng
1894.95	154.08	95.02	3n	Eng
1907.64	153.81	95.57	3n	β

The small star is not in DM, and I do not find it in any of the catalogues examined. A mean of the first two measures compared with the last would indicate a proper motion of 0″.028 in 332°.1 for the large star, but evidently this cannot be right, since one of the measures must have a considerable error. It is probable that the two stars have the same motion. Later measures will show.

The motion of A from meridian positions is also uncertain:

Auwers	0″.182	in	262°.4
Boss	0.026	in	240.0

Lalande 7097 (7.0...10.2...10.3)

R. A. 3ʰ 46ᵐ 16ˢ Decl. + 59° 17′

A and B

1907.845	356°.17	149″.85
.848	356.23	149.82
.867	356.10	150.27

A and C

1907.845	40°.10	187″.47
.848	40.08	187.63
.867	40.12	187.69

The only measures are:

AB	1893.26	355°.21	153″.38	3n	Eng
	1907.85	356.17	149.98	3n	β
AC	1893.26	38.72	187.18	3n	Eng
	1907.85	40.30	187.60	3n	β

These positions give the proper motion of the principal star:

AB	R. A. — 0″.189	Decl. + 0″.219
AC	0.292	0.204
	0.240	0.211

From this and the meridian observations we have:

Measures	0″.320	in	311°.3
Stumpe	0.375	in	300.5
Porter	0.365	in	298.3

There are two new and nearer companions to the large star not previously seen. It will be of interest to see whether either belongs to the moving star.

A and *a* (13.3)

1907.845	214°.7	6″.97
.899	217.1	6.78
1907.87	215.9	6.77

A and *b* (12.8)

1907.845	67°.0	33″.30
7.964	67.3	33.29
8.102	67.9	33.49
1907.97	67.4	33.36

Piazzi III. 215 (6.2...9.5)

R. A. 3ʰ 53ᵐ 54ˢ Decl. + 17° 51′

1909.666	277°.30	161″.17
.703	277.48	161.22
.706	277.33	161.48
1909.69	277.37	161.29

The small star is DM (17°) 664. No other measures. The proper motion of the principal star is:

A. G. Berlin	0″.118	in	108°.8
Boss	0.141	in	105.2
Newcomb	0.143	in	104.9

37 *Tauri* (4.2...9.4)

R. A. 3ʰ 57ᵐ 36ˢ Decl. + 21° 45′

1907.581	189°.45	137″.52
.638	189.40	137.35
.657	189.25	137.47

For the proper motion of A we have the following positions:

1853.83	186°.91	138″.69	1n	OΣ
1880.73	188.65	138.33	4n	Doub.
1887.08	188.25	137.41	2n	Eng
1907.62	189.37	137.45	3n	β

From these measures the corrected proper motion of the principal star is:

0″.106 in 111°.7

This has been given from meridian positions:

Auwers	0″.094	in	128°.1
Newcomb	0.113	in	120.9
Boss	0.113	in	124.4

39 *Tauri* (6.5...8.2)

R. A. 3ʰ 58ᵐ 14ˢ Decl. + 21° 41′

A and B

1907.581	2°.65	169″.43
.638	2.62	169.30
.657	2.70	169.64

B is Piazzi III. 237. It could not be assumed, without satisfactory evidence, that a star of this magnitude was fixed. The measures of BC, however, show no sensible change, and therefore it is practically certain that B has no proper motion. The measures of AB are:

1887.08	3°.87	168″.51	3n	Eng
1907.62	2.66	169.46	3n	β

The proper motion of 39 *Tauri* is:

Measures	0″.179	in	108°.4
Auwers	0.205	in	124.1
Hedrick	0.217	in	127.0
Boss	0.222	in	128.4

B and C (10.8)

1907.581	127°.93	61″.04
.638	127.65	61.20
1907.61	127.79	61.12

One of the prior measures must be rejected for obvious reasons. The other positions seem to show no change in twenty years. Engelhardt calls C 12.2 m.

1887.08	128°.42	63″.05	1n	Eng
1887.08	128.20	61.62	1n	Eng
1887.09	128.15	61.61	1n	Eng
1895.06	129.58	61.07	1n	Eng

Lalande 7788 and 7791

R. A. 4ʰ 4ᵐ 4ˢ Decl. — 17° 48′

A and B (7.4...8.5)

1908.044	138°.68	125″.12
.063	138.97	125.36
.079	138.90	125.03

Meridian positions of both stars will be found in the catalogues of Bonn, Bruxelles, Cincinnati and Washington. They have very nearly the same proper motion. The direct measures are:

1894.02	139°.10	126″.26	2n	Eng
1908.06	138.85	125.17	3n	β

From these measures the relative motion is:

0″.087 in 165°.8

The proper motion of L 7788 from transits is given:

Stumpe	0″.171	in	186°.2
Paris	0.178	in	180.0
Porter	0.154	in	180.0

I have measured a faint star for the verification of this proper motion hereafter.

A and *a* (13.0)

1908.102	39°.55	115″.17
9.071	39.53	116.15
9.763	39.10	115.42
1908.98	39.39	115.58

45 *Tauri* (6.0...10.1)

R. A. 4ʰ 4ᵐ 57ˢ Decl. + 5° 13′

1907.845	42°.17	125″.37
7.865	42.35	125.37
7.879	42.37	125.76
8.022	42.60	125.72

For comparison we have:

1888.07	43°.32	128″.53	2n	Eng
1895.09	42.95	127.99	2n	Eng
1907.90	42.37	125.55	4n	β

The meridian value of the proper motion seems to be too small.

Measures	0″.195	in	74°.8
Auwers	0.122	in	79.1
Porter	0.124	in	80.3
Boss	0.143	in	84.8

48 *Tauri* (6.5...12.0)

R. A. 4ʰ 8ᵐ 58ˢ Decl. + 15° 6′

A and B

1909.725	31°.57	138″.95
.744	31.63	139.10
.780	31.30	138.64
1909.74	31.50	138.90

A and C (11.2)

1909.763	308°.95	147″.08
.780	308.87	146.53
1909.77	308.91	146.80

No other measures of the small stars. The proper motion of 48 *Tauri* is given from meridian observations:

Auwers	0″.108	in	95°.3
Boss	0.125	in	101.6

51 *Tauri* (5.9...9.5)

R. A. 4ʰ 11ᵐ 17ˢ Decl. + 21° 17′

1909.666	62°.23	166″.50
.703	62.55	166.51
.706	62.00	166.79
1909.69	62.26	166.60

The small star is DM (21°) 619. No other measures, and no accurate meridian place of B. The proper motion of the principal star is:

Auwers	0″.088	in	109°.3
Boss	0.112	in	110.4
Newcomb	0.101	in	111.5

57 *Tauri* (5.8...13.7)

R. A. 4ʰ 13ᵐ 12ˢ Decl. + 13° 45′

1909.725	359°.17	34″.76
.780	359.40	34.70
.838	359.40	34.30
1909.78	359.32	34.59

No other measures. The proper motion of the bright star is:

Auwers	0″.095	in	100°.9
Boss	0.121	in	103.4

60 *Tauri* (6.0...13.4)

R. A. 4ʰ 15ᵐ 11ˢ Decl. + 13° 48′

A and B

1909.760	233°.50	78″.97
.780	233.54	79.36
.838	233.40	79.49
1909.79	233.48	79.27

A and C (12.9)

1909.782	333°.27	106″.88
.838	333.20	107.17
1909.81	333.23	107.02

No other measures. The proper motion of 60 *Tauri* is given from meridian positions:

Auwers	0″.091	in	105°.3
Boss	0.118	in	105.2

61 *Tauri* (4.2...12.9)

R. A. 4^{h} 16^{m} 1^{s} Decl. + 17° 17′

1909.706	340°.45	106″.78
.725	340.60	106.60
.744	340.70	106.31
.760	340.58	106.69
1909.73	340.58	106.60

No other measures. The proper motion of 61 *Tauri* is:

Auwers	0″.096	in	106°.4
Newcomb	0.112	in	105.6
Boss	0.115	in	106.7

64 *Tauri* (5.1...13.6)

R. A. 4^{h} 17^{m} 11^{s} Decl. + 17° 10′

1909.722	245°.63	137″.40
.763	245.08	137.48
.780	245.87	137.13
1909.75	245.53	137.34

No earlier measures. The proper motion is:

Auwers	0″.105	in	101°.0
Paris	0.163	in	90.0
Boss	0.125	in	109.2

κ^1 65 *Tauri* (4.6...12.5)

R. A. 4^{h} 18^{m} 13^{s} Decl. + 22° 1′

1909.722	266°.20	135″.35
.780	265.67	135.64
.782	266.20	135.62
1909.74	266.02	135.54

No other measures. For the proper motion of the large star we have:

Auwers	0″.078	in	134°.1
Newcomb	0.103	in	120.4
Boss	0.113	in	115.2

κ^2 67 *Tauri* (5.6...12.8)

R. A. 4^{h} 18^{m} 16^{s} Decl. + 21° 56′

1909.763	208°.42	107″.12
.780	209.24	106.93
.782	209.00	106.72
1909.77	208.89	106.92

No other measures. κ^1 and κ^2 *Tauri* make Σ 9, App. I. The proper motion of the latter is:

Auwers	0″.130	in	113°.0
Newcomb	0.133	in	114.9
Boss	0.131	in	117.2

70 *Tauri* (6.8...12.8)

R. A. 4^{h} 18^{m} 46^{s} Decl. + 15° 40′

1909.936	342°.92	124″.37
10.049	343.08	124.59
10.109	342.95	124.12
1910.03	342.98	124.36

No other measures. The proper motion of 70 *Tauri* is given.

Auwers	0″.074	in	96°.2
Boss	0.115	in	104.6

υ^2 69 *Tauri* (4.5...12.6)

R. A. 4^{h} 19^{m} 8^{s} Decl. + 22° 32′

1909.763	288°.58	104″.15
.780	288.77	104.32
.782	288.64	104.47
1909.77	288.66	104.31

No other measures. The proper motion of the large star is:

Auwers	0″.100	in	109°.9
Boss	0.123	in	114.9

71 *Tauri* (4.8...11.3)

R. A. 4^{h} 19^{m} 30^{s} Decl. + 15° 21′

1909.802	149°.11	136″.89
09.936	149.32	136.67
10.049	149.10	137.31
1909.93	149.18	136.96

No other measures. The proper motion of 71 *Tauri* is:

Auwers	0″.098	in	98°.2
Boss	0.117	in	103.3

Piazzi IV. 82 (6.0...10.8)

R. A. 4^{h} 20^{m} 53^{s} Decl. + 21° 21′

1909.782	232°.57	161″.75
.838	232.70	161.22
.936	232.58	161.18
1909.84	232.62	161.38

No other measures. The proper motion is given:

Boss	0″.118	in	112°.4
A. G. Ber.	0.093	in	118.1

ε *Tauri* (3.9...10.9)

R. A. 4^{h} 21^{m} 37^{s} Decl. + 18° 55′

1909.706	268°.13	181″.49
.722	268.30	181.74
.725	268.07	181.73
1909.71	268.17	181.65

No other measures. The proper motion of ε *Tauri* is given:

Auwers	0″.103	in	107°.6
Boss	0.120	in	108.4
Newcomb	0.121	in	106.3

81 *Tauri* (5.9...9.0)

R. A. $4^h 23^m 48^s$ Decl. + 15° 26′

1909.936	338°.59	161″.84
10.049	338.78	161.83
10.109	338.70	161.56
1910.03	338.69	161.74

B is DM (15°) 638. No other measures. The proper motion of 81 *Tauri* is:

Auwers	0″.102	in	100°.2
Boss	0.110	in	105.8
Porter	0.095	in	103.4

83 *Tauri* (5.6...11.4)

R. A. $4^h 23^m 52^s$ Decl. + 13° 28′

1910.933	105°.10	111″.93
10.971	105.17	112.00
11.104	105.00	111.65
1910.97	105.09	111.86

No prior measures. The proper motion of 83 *Tauri* is given from meridian positions:

Auwers	0″.093	in	102°.5
Boss	0.110	in	100.5

48 *Eridani* (4.0...13.2)

R. A. $4^h 30^m 19^s$ Decl. — 3° 35′

1909.760	169°.82	50″.62
.763	169.35	51.25
.780	169.64	50.86
1909.77	169.60	50.91

No other measures. The proper motion is very small, and therefore uncertain.

Auwers	0″.020	in	275°.9
Boss	0.002	in	180.0
Newcomb	0.008	in	270.7

89 *Tauri* (6.1...12.0)

R. A. $4^h 31^m 17^s$ Decl. + 15° 47′

1910.684	49°.83	143″.01
.780	49.70	142.67
.835	49.85	142.58
1910.77	49.79	142.75

No other measures. The proper motion of 89 *Tauri* is given:

Auwers	0″.079	in	98°.0
Boss	0.094	in	108.0

90 *Tauri* (4.5...13.5)

R. A. $4^h 31^m 27^s$ Decl. + 12° 16′

A and B

1910.684	321°.4	43″.92
.835	322.8	44.19
.893	322.1	44.30
1910.80	322.1	44.14

A and C (10.6)

1910.684	311°.87	115″.17
.720	311.93	114.73
.777	311.75	114.98
1910.73	311.85	114.96

No other measures. The proper motion of 90 *Tauri* is given:

Auwers	0″.082	in	94°.2
Boss	0.104	in	95.5

Piazzi IV. 146 (5.6...9.5)

R. A. $4^h 32^m 36^s$ Decl. + 7° 38′

A and B

1909.666	248°.8	70″.91
.722	248.9	70.98
.744	248.6	70.75
1909.71	248.8	70.88

A and C (9.0)

1909.666	316°.40	299″.24
.722	316.17	299.49
.744	316.10	298.58
.763	316.22	298.84
1909.72	316.22	299.04

B and C are respectively DM (7°) 680 and 679. No other measures. From the meridian observations in A. G. Leipsic we have the following:

AB	1884.1	247°.1	69″.2
AC	1884.1	316.6	299.4

The proper motion of the principal star is:

Boss	0″.082	in	90°.7

Piazzi IV. 169 (5.5...11.4)

R. A. $4^h 37^m 47^s$ Decl. + 10° 55′

A and B

1910.777	97°.38	79″.36
.780	96.48	79.40
.835	97.08	78.98
1910.40	96.98	79.25

B and C (12.6)

1910.780	358°.0	12″.75
.835	360.6	12.08
1910.81	359.3	12.41

The proper motion of the principal star is:

Boss	0″.098	in	98°.2

DM (11°) 646 (5.6...13.4)

R. A. 4ʰ 39ᵐ 21ˢ Decl. + 11° 29′

A and B

1911.663	202°.8	38″.81
.720	204.3	39.08
1911.69	203.5	38.94

A and C (13.1)

1910.780	231°.73	90″.59
11.663	232.63	90.89
11.720	232.88	90.45
1911.39	232.41	90.64

No other measures. The proper motion of the large star is:

Boss	0″.066	in	90°.8

DM (45°) 992 (6.5...11.8)

R. A. 4ʰ 42ᵐ 54ˢ Decl. + 45° 39′

1909.818	87°.20	101″.38
.820	86.73	101.64
.933	86.86	101.73
1909.86	86.93	101.58

No other measures. The large star is Groombridge 884. The proper motion is given:

A. G. Bonn	0″.676	in	145°.3
Paris	0.692	in	145.4
Porter	0.666	in	147.2
Groombridge	0.684	in	145.4

1 *Orionis* (4.5...10.0)

R. A. 4ʰ 43ᵐ 20ˢ Decl. + 6° 45′

1907.675	138°.48	94″.92
.692	138.48	94.56
.769	138.15	94.36

For the proper motion of the large star we have the following measures:

1852.87	128°.08	112″.48	2n	OΣ
1869.10	130.67	107.10	1n	OΣ
1884.15	133.75	102.22	2n	HΣ
1907.71	138.37	94.61	3n	β

The corrected motion of 1 *Orionis* is:

0″.472 in 86°.1

This is given from meridian positions:

Auwers	0″.444	in	87°.9
Porter	0.449	in	87.3
Newcomb	0.466	in	83.9
Boss	0.472	in	87.6

97 *Tauri* (5.4...9.5)

R. A. 4ʰ 44ᵐ 21ˢ Decl. + 18° 38′

A and DM (18°) 742

1909.666	302°.50	174″.38
.744	302.50	174.66
.859	302.70	174.47
1909.75	302.57	174.50

No other measures. The proper motion of 97 *Tauri* is:

Auwers	0″.075	in	116°.9
Newcomb	0.090	in	112.6
Boss	0.091	in	113.2

7 *Orionis* (5.0...8.7)

R. A. 4ʰ 48ᵐ 17ˢ Decl. + 9° 57′

1907.845	248°.88	171″.23
.865	248.80	171.54
.879	248.60	171.28
.974	248.53	171.76

The prior measures are not consistent with this position.

1887.09	247°.92	171″.78	2n	Eng
1895.09	248.20	172.59	2n	Eng
1907.89	248.70	171.45	4n	β

A comparison of a mean of the first two with the last indicates a motion of 0″.123 in 180° for the large star, but this is uncertain, and further measures are needed. The small star is DM (9°) 682, and is given in Weisse and A. G. Leipsic. In the former the observed difference is erroneous.

Auwers	0″.132	in	167°.7
Porter	0.134	in	166.0
Gr. 10-yr.	0.019	in	270.0
Boss	0.145	in	157.8

I have measured a nearer star:

A and *a* (12.8)

1907.845	4°.3	33″.08
.865	3.1	32.86
.974	3.6	33.28
1907.89	3.7	33.07

101 *Tauri* (7.0...12.2)

R. A. 4ʰ 52ᵐ 31ˢ Decl. + 15° 44′

1910.780	145°.50	105″.99
.835	145.86	106.83
.838	146.38	106.52
1910.82	145.91	106.45

No other measures. Small proper motion.

Auwers	0″.087	in	105°.3
Boss	0.104	in	109.1

13 *Orionis* (6.0...9.5)

R. A. $5^h\ 1^m\ 4^s$ Decl. + 9° 19′

1907.675	264°.26	124″.11
.692	264.50	124.05
.769	264.18	124.37
1909.722	264.95	123.90
.744	264.90	123.75
.760	264.58	124.25

The small star is not in DM. The measures are:

1852.90	255°.20	128″.21	2n	OΣ
1876.14	259.02	126.50	2n	OΣ
1907.71	264.31	124.18	3n	β
1909.74	264.81	123.97	3n	β

The correction to the proper motion of 13 *Orionis* is very small.

Measures	0″.373	in	181°.2
Auwers	0.374	in	183.8
Porter	0.376	in	182.9
Boss	0.381	in	179.1

The comparison star is given in A. G. Leipsic from which we have:

1884.1	260°.4	123″.7

β *Eridani* (3.0...11.0)

R. A. $5^h\ 1^m\ 59^s$ Decl. — 5° 15′

1907.636	142°.40	116″.73
.675	142.40	117.06
.692	142.34	117.01

The only measures are:

1879.95	143°.60	116″.65	2n	β^s
1907.67	142.38	116.93	3n	β

Giving for the proper motion of the large star:

Measures	0″.090	in	238°.7
Auwers	0.135	in	236.2
Newcomb	0.112	in	228.3
Boss	0.118	in	228.2

16 *Orionis* (5.8...12.6)

R. A. $5^h\ 2^m\ 44^s$ Decl. + 9° 40′

A and B

1909.760	121°.95	88″.34
.838	122.13	88.80
1909.80	122.04	88.57

A and C (10.3)

1909.722	227°.83	167″.86
.760	227.72	168.18
.838	227.80	168.03
1909.77	227.78	168.02

No other measures. The proper motion of 16 *Orionis* is small.

Auwers	0″.068	in	96°.7
Boss	0.074	in	94.6

DM (37°) 1074 (8.6...9.0)

R. A. $5^h\ 3^m\ 5^s$ Decl. + 37° 9′

1909.093	241°.58	135″.10
.706	241.40	135.17
.763	241.35	134.77
1909.52	241.44	135.01

The smaller star is DM (37°) 1072. There is no evidence of proper motion in either.

1878.02	241°.04	135″.25	2n	Bl

SD (9°) 1094 (8.3...9.2)

R. A. $5^h\ 6^m\ 17^s$ Decl. — 9° 5′

1908.750	230°.83	119″.03
08.884	231.23	119.34
08.898	231.34	119.45
1910.835	231.41	118.33
10.931	231.48	118.14
10.933	231.03	118.22
11.088	231.20	117.76

The comparison star is SD (9°) 1093. The other is supposed to have a considerable proper motion. This is supported by the SD positions which give 236°: 116″. No other measures. The mean results of the foregoing are:

1908.84	231°.13	119″.27	3n
1910.95	231.28	118.11	4n

These positions indicate for the approximate proper motion of A:

0″.57 in 216°.2

The following is from meridian observations:

1890	226°.8	131″.5	Herz

DM (39°) 1257 (7.6...12.7)

R. A. $5^h\ 11^m\ 49^s$ Decl. + 39° 13′

A and B

1909.821	342°.6	18″.97
.859	342.7	18.90
1909.84	342.6	18.93

A and C (9.0)

1909.802	317°.64	189″.72
.818	317.63	189.87
.821	317.31	189.53
1909.81	317.53	189.71

A is the principal star of the Herschel cluster, *h* 350; sometimes called red, but only slightly reddish now. There are many stars much nearer A than C; one of the nearest is measured above. C is DM (39°) 1254. For comparison we have:

1878.04	317°.52	190″.60	2n	Bl
1880.	317.6	189.4		A. G. Lund
1893.19	317.6	190.01		Donner

The last position is derived from astrographic plates.

γ ***Orionis*** (2.0 . . . 12.5)

R. A. $5^h 18^m 42^s$ Decl. + 6° 14′

1909.071	144°.07	179″.69
.093	144.50	180.10
.112	144.23	179.84
1909.09	144.27	179.88

The earlier measures are:

1879.95	143°.9	178″.18	2n	β^s

From the two positions the proper motion of γ *Orionis* is:

0″.070 in 358°.3

If the measures are substantially correct, the motion is practically all in declination. Further observations of the small star should be made. This movement from meridian observations appears to be uncertain in both amount and direction. The separate results differ from each other as well as from that given above.

Newcomb	0″.018	in	200°.0
Auwers	0.029	in	241.1
Boss	0.020	in	201.4

DM (34°) 1044 (9.3 . . . 10.2)

R. A. $5^h 19^m 12^s$ Decl. + 34° 4′

1910.627	291°.12	192″.54
.720	291.50	192.76
.742	291.33	193.32
1910.70	291.32	192.87

The principal star is red. No sensible proper motion.

1878.02	290°.96	192″.22	2n	Bl

φ ***Aurigae*** (5.4)

R. A. $5^h 19^m 42^s$ Decl. + 34° 22′

A and D (8.5)

1908.747	14°.60	207″.27
.766	14.65	207.35
.769	14.03	207.14
1908.76	14.43	207.25

For comparison we have:

1874.1	14°.0	206″.1		A. G. Leid.
1879.48	14.39	206.45	2n	Bl

It is more than probable that the apparent change in distance is due solely to the proper motion of the large star, although the other is bright enough to have some motion of its own. This is DM (34°) 1049. The proper motion of φ *Aurigae* is given from meridian positions:

Auwers	0″.047	in	203°.4
Boss	0.056	in	175.0

For a better determination of this hereafter, I have connected two small stars, not previously noted:

A and B (14.7)

1908.769	350°.7	20″.49
.788	352.8	20.36
.824	350.3	20.90
1908.79	351.3	20.58

A and C (10.8)

1908.747	71°.25	61″.24
.766	71.20	61.25
.769	71.31	61.48
1908.76	71.25	61.32

Lalande 10299 (8.5 . . . 11.0)

R. A. $5^h 22^m 29^s$ Decl. — 3° 34′

1907.769	202°.20	134″.51
.772	201.82	134.21
.791	202.30	134.15
1911.104	202.28	131.02
.107	202.13	130.96
.142	202.07	131.46
.145	202.38	131.29

The mean results are:

1907.78	202°.11	134″.29
1911.13	202.21	131.18

No other measures. The proper motion is:

Measures	0″.933	in	198°.1
Paris	0.912	in	199.4
Porter	0.877	in	200.4

SD (3°) 1123 (8.7 . . . 10.0)

R. A. $5^h 25^m 23^s$ Decl. — 3° 42′

1907.769	267°.80	115″.23
.772	267.62	114.93
.791	267.60	114.37
.810	267.98	114.95
1910.835	270.91	117.04
.931	271.28	117.07
.933	270.60	116.73
.971	271.08	116.88

The mean results of the measures are:

1892.11	250°.62	108″.70	2n	Eng
1907.78	267.75	114.87	4n	β
1910.92	270.97	116.93	4n	β

Therefore the proper motion of the larger star is:

Measures	2″.131	in	158°.8
Porter	2.246	in	162.1

This star is supposed to have a small parallax.

ε ***Orionis*** (2.0 . . . 10.7)

R. A. $5^h 30^m 6^s$ Decl. — 1° 17′

1907.772	56°.82	179″.72
.791	57.25	180.09
.810	57.43	179.98

The only measures are:

1879.89	57°.05	179″.92	2n	β^3
1907.79	57.17	179.93	3n	β

If the large star has any proper motion at all, it is evidently far below the errors probable in observations with any instrument; and any result deduced from such positions has no meaning. This appears from the transit observations:

Auwers	0″.020	in	272°.9
Newcomb	0.001	in	352.9
Boss	0.002	in	180.0

Piazzi V. 146 (6.7...9.6)

R. A. $5^h\ 31^m\ 36^s$ Decl. + 53° 27′

1907.731	70°.58	97″.30
.769	70.38	97.64
.788	70.60	97.55
.810	70.76	97.14
.845	70.70	97.55

These stars have exactly the same proper motion.

1891.26	70°.78	97″.47	2n	Eng
1907.79	70.60	97.44	5n	β

The small star is DM (53°) 935. Both are in A. G. Harvard, but the difference in declination is erroneous. The proper motion is given:

Stumpe	0″.570	in	181°.4
Greenwich	0.510	in	179.2
Porter	0.539	in	182.1
Boss	0.512	in	178.7

For an independent determination of this proper motion hereafter, I have measured a faint star from each:

A and *a* (12.7)

1907.788	301°.00	81″.92
8.000	301.50	82.15
8.063	302.20	82.69
1907.95	301.57	82.25
1909.859	302°.20	82″.78
09.936	302.68	82.97
10.605	302.16	83.02
1910.13	302.35	82.92

B and *b* (12.4)

1907.788	159°.62	131″.19
8.000	159.48	131.02
8.063	159.58	131.33
1907.95	159.56	131.18
1909.859	159°.27	129″.96
09.936	159.25	129.06
10.605	159.03	130.00
1910.13	159.18	129.67

A and DM (53°) 930 (9.0)

1874	Δ R. A. 76″.3	Δ Decl. 78″.8	A. G. Harv.
1909.89	76.2	98.0	β

Lalande 10797 (7.4...11.1)

R. A. $5^h\ 37^m\ 47^s$ Decl. + 37° 15′

1909.093	111°.49	129″.91
.802	111.27	129.09
.818	111.23	129.25
.821	111.46	129.06
1909.63	111.36	129.33

The earlier measures are as follows:

1880.52	114°.13	148″.34	2n	Bl

Therefore the proper motion of Lalande 10797 is:

0″.693 in 132°.2

From meridian positions this has been given:

Stumpe	0″.689	in	135°.7
Porter	0.688	in	137.2

Lalande 10959 (8.7...9.2)

R. A. $5^h\ 40^m\ 10^s$ Decl. — 15° 6′

A and B

1908.060	158°.35	142″.93
.159	158.00	142.90
.750	157.73	142.77
1908.32	158.03	142.87

A and C (9.7)

1908.060	221°.80	168″.78
.159	221.72	167.76
.750	221.60	167.98
1908.32	221.71	168.17

B and C are respectively SD (15°) 1153 and 1150. The following are the only other measures:

AB	1894.04	157°.92	145″.62	4n	Eng
AC	1894.04	221.03	168.70	3n	Eng

Comparing these positions with the recent measures, we have for the annual motion of the principal star:

AB	R. A. + 0″.091	Decl. — 0″.170
AC	0.081	0.120
	+ 0.086	— 0.145

Therefore the corrected proper motion of Lalande 10959 is:

0″.169 in 149°.3

This has been given from meridian observations:

Stumpe	0″.165	in	146°.3
Porter	0.162	in	133.4

There are other small stars near, two of which I have measured:

A and *a* (13.3)

1908.060	228°.62	27″.11
.159	227.10	26.68
.750	227.63	27.14
1908.32	227.78	26.98

C and *c* (10.1)

1908.159	212°.58	34″.31
.750	212.27	34.74
1908.50	212.42	34.52

A and B are given in A. G. Washington.

134 *Tauri* (5.0...10.4)

R. A. 5ʰ 42ᵐ 48ˢ Decl. + 12° 37′

1909.818	129°.25	118″.69
.859	129.27	118.97
.936	129.15	119.04
1909.87	129.22	118.90

The proper motion, if any, is small. No other measures.

Auwers	0″.032	in	252°.0
Boss	0.029	in	206.9

δ *Aurigae* (4.0...9.6)

R. A. 5ʰ 49ᵐ 39ˢ Decl. + 54° 16′

A and B

1907.845	271°.25	115″.09
7.879	271.35	115.32
8.000	271.03	115.40
8.044	271.40	115.12
1907.94	271.26	115.23

A and DM (54°) 972 (9.3)

1907.845	66°.62	196″.91
8.000	66.78	197.19
8.044	66.95	197.27
1907.96	66.78	197.12

DM (54°) 972 and *a* (10.2)

1908.000	111°.35	93″.45
.063	111.60	93.52
1908.03	111.47	93.48

For the proper motion of δ *Aurigae* we have the following measures:

1888.24	270°.00	113″.36	2n	Eng
1894.26	270.37	114.31	2n	Eng
1907.94	271.26	115.23	4n	β

These positions give for the corrected proper motion of the large star:

0″.156 in 145°.3

This is given from meridian observations:

Auwers	0″.142	in	150°.0
Groombridge	0.157	in	148.7
Newcomb	0.157	in	138.4
Boss	0.153	in	145.8

The DM star is in A. G. Harvard, and the relative positions compared with the above measures (68°.2: 199″.6 for 1877) give a proper motion of 0″.178 in 131°.3 which is doubtless in error, as there is no probability of the small star having any sensible movement. This will appear from later measures of both stars.

Lalande 11327 (7.0...)

R. A. 5ʰ 52ᵐ 25ˢ Decl. — 4° 39′

A and C (9.0)

1907.865	297°.03	178″.75
7.964	296.85	177.80
7.997	296.82	178.23
8.022	296.85	178.64
1907.96	296.89	178.35

A and B (13.8)

1908.022	1°.5	4″.14
.079	0.5	4.25
.102	1.6	4.11
1908.07	1.2	4.17

AB is the double star, Aitken 322, discovered in 1902 (β G. C. 3082). The measures show that the small companion is moving with the principal star. For AC we have:

1892.11	295°.68	176″.77	2n	Eng
1907.96	296.89	178.35	4n	β

Therefore the proper motion of A is:

0″.273 in 185°.0

C is SD (4°) 1308. I do not find it in any other star catalogue. The motion of A from transit observations is given:

Paris	0″.244	in	180°.0
Porter	0.221	in	180.0

1 *Geminorum* (4.3...13.0)

R. A. 5ʰ 56ᵐ 55ˢ Decl. + 23° 16′

1911.720	26°.28	96″.57
.775	26.03	96.68
.813	26.18	96.68
1911.77	26.16	96.64

No other measures. The proper motion is given:

Auwers	0″.094	in	188°.4
Hedrick	0.109	in	179.2
Boss	0.108	in	184.4

Lalande 11471 (6.0...9.6)

R. A. 5ʰ 58ᵐ 7ˢ Decl. + 35° 24′

1907.731	16°.30	120″.30
.769	15.75	120.70
.788	15.85	120.39

For the proper motion we have:

1892.26	15°.17	116″.02	1n	Eng
1907.76	15.97	120.46	3n	β

As the first position is only a single observation, the resulting value of the proper motion may not be any better than the others. The results are:

Measures	0″.305	in	216°.0
Stumpe	0.315	in	203.8
Porter	0.327	in	206.1
Paris	0.306	in	196.5

40 *Camelopardali* (5.4...10.5)

R. A. 6ʰ 4ᵐ 54ˢ Decl. + 60° 2′

1908.769	355°.66	102″.63
.804	355.88	102.65
.824	356.22	102.73
1908.80	355.92	102.67

In the first instance this was taken by mistake for 4 *Lyncis,* which has a similar companion, with practically the same angle, distance and magnitude. There are no other measures. The proper motion of 40 *Camel.* is uncertain.

Auwers	0″.016	in	151°.8
Boss	0.048	in	115.8

Piazzi VI. 49 (7.0...10.2)

R. A. 6ʰ 10ᵐ 55ˢ Decl. + 5° 8′

1907.769	246°.23	189″.86
.791	246.48	189.60
.810	246.48	189.50

The only measures are:

1891.21	247°.55	191″.87	2n	Eng
1907.79	246.40	189.65	3n	β

From which the proper motion of A is:

Measures	0″.267	in	306°.9
Stumpe	0.312	in	301.7
Porter	0.300	in	303.3
Boss	0.283	in	303.6

For a further independent value of the motion of A, I have connected two faint stars:

A and *a* (13.0)

1911.796	265°.13	58″.50
11.832	264.83	59.15
12.066	264.83	57.86
1911.90	264.93	58.50

A and *b* (13.0)

1911.796	231°.73	69″.11
11.832	231.30	69.64
12.066	231.17	69.22
1911.90	231.40	69.32

β *Canis Maj* (2.0...9.8)

R. A. 6ʰ 17ᵐ 24ˢ Decl. — 17° 54′

1908.102	339°.80	185″.87
.192	339.86	185.97

The only measures are:

1879.89	339°.05	184″.96	2n	β^s
1908.15	339.83	185.92	2n	β

It is evident that the proper motion of the large star is smaller than the probable errors of observations with the micrometer, to say nothing of meridian instruments, and any result from either at this time would be of no certain value. The great discordance in the values heretofore given by the authorities is sufficient evidence on this point.

Auwers	0″.025	in	293°.6
Newcomb	0.009	in	294.2
Boss	0.007	in	270.0

The measures imply a larger motion, and nearly equal in both co-ordinates. Measures of these stars half a century hence will contribute something of value to this question.

6 *Lyncis* (6.0...9.0)

R. A. 6ʰ 20ᵐ 22ˢ Decl. + 58° 15′

1907.974	116°.62	179″.51
8.000	116.65	179.52
8.025	116.93	179.61

The small star is DM (58°) 933.

1851.61	121°.70	188″.17	3n	OΣ
1861.35	120.90	186.56	1n	OΣ
1884.25	119.00	183.08	2n	HΣ
1908.00	116.73	179.55	3n	β

These measures give for the proper motion of 6 *Lyncis:*

0″.307 in 180°.9

From transit observations we have:

Auwers	0″.334	in	184°.6
Porter	0.334	in	184.7
Newcomb	0.326	in	179.6
Boss	0.330	in	181.6

10 *Monocerotis* (5.0...9.2)

R. A. 6ʰ 22ᵐ 3ˢ Decl. — 4° 41′

A and B

1907.769	256°.53	77″.37
.772	256.72	77.22
.791	256.95	77.49

A and C (9.2)

1907.769	231°.07	80″.72
.772	231.00	80.62
.791	230.85	80.56

The only measures are:

AB	1879.89	256°.60	76″.96	2n	β
	1907.78	256.73	77.36	3n	β
AC	1879.89	231.00	80.91	2n	β
	1907.78	230.97	80.63	3n	β

It is evident that the proper motion is much too small to be separated from the errors probable in any class of observations. Repeating these measures after a long interval will furnish data on this point.

The meridian positions give most contradictory results:

Auwers	0″.032	in	326°.4
Newcomb	0.016	in	67.3
Boss	0.014	in	347.9

8 *Lyncis* (6.0...9.0)

R. A. 6ʰ 26ᵐ 28ˢ Decl. + 61° 35′

A and B

1907.848	79°.77	156″.84
8.000	80.02	157.21
8.025	80.02	156.81
1907.96	79.94	156.95

B and *b* (12.7)

1907.848	252°.75	71″.06
8.000	252.42	71.16
8.025	252.53	70.78
1907.96	252.57	71.00

The faint star between A and B is measured for ascertaining whether or not B has any motion.

The measures of AB are:

1854.31	84°.63	144″.53	3n	OΣ
1884.25	81.92	151.27	2n	HΣ
1907.96	79.94	156.95	3n	β

These positions make the proper motion of 8 *Lyncis:*

0″.327 in 217°.3

Some of the values from transit observations are:

Auwers	0″.352	in	216°.6
Newcomb	0.335	in	214.4
Boss	0.342	in	214.6

DM (38°) 1539 (6.3...10.7)

R. A. 6ʰ 28ᵐ 18ˢ Decl. + 38°32′

1908.884	222°.25	117″.97
.898	222.18	117.90
.900	222.35	117.79
1908.89	222.29	117.89

The only other measures are:

1878.58	221°.74	118″.60	2n	Bl

The large star is reddish (Groombridge 1190). The proper motion is given:

Greenwich	0″.030	in	195°.8
Boss	0.036	in	165.0

γ *Geminorum* (2.5...11.8)

R. A. 6ʰ 28ᵐ 26ˢ Decl. + 16° 30′

A and B

1907.692	295°.45	135″.51
.772	295.13	135.57
.807	295.20	135.36

A and C (11.5)

1907.692	335°.25	143″.60
.772	335.40	143.50
.807	335.23	143.41

Unfortunately the early positions depend on a single night. This will be remedied by measures after another quarter-century interval.

AB	1880.03	294°.70	133″.04	1n	β
	1907.76	295.26	135.48	3n	β
AC	1880.03	335.50	141.74	1n	β
	1907.76	335.29	143.50	3n	β

The mean motion from both stars is:

Measures	0″.083	in	140°.6
Auwers	0.047	in	140.0
Newcomb	0.067	in	135.2
Boss	0.065	in	136.5

50 *Aurigae*

R. A. 6ʰ 30ᵐ 46ˢ Decl. + 42° 36′

A and B (10.6)

1907.791	109°.23	52″.69
.810	109.08	52.32
.845	109.45	52.53
1907.81	109.25	52.51

A and C (11.3)

1907.791	74°.75	99″.40
.810	74.83	99.42
.845	75.35	99.32
1907.81	74.98	99.38

No other measures. The proper motion of 50 *Aurigae* is small.

Auwers	0″.069	in	192°.1
Boss	0.061	in	174.8

This was measured in the first instance by mistake for 58 *Aurigae.* The similarity in the arrangement of the three components will be noticed. From the *Astrographic Catalogue* we have for AB:

1894.95	110°.0	53″.25	Donner

58 *Aurigae* (5.2)

R. A. 6ʰ 42ᵐ 17ˢ Decl. + 41° 55′

A and B (10.2)

1907.807	102°.88	40″.60
.810	103.06	40.71
.845	103.05	40.70
1907.82	103.00	40.67

A and C (11.8)

1907.807	75°.96	117″.78
.845	75.72	117.67
1907.82	75.84	117.72

No other measures of C. For AB we have:

1888.28	107°.67	41″.03	2n	Eng
1894.25	106.15	40.82	2n	Eng
1894.95	106.3	40.66		Donner
1907.82	103.00	40.67	3n	β

A mean of the first two and the last gives the proper motion of 58 *Aurigae:*

0″.156 in 189°.2

This is given from meridian positions:

Groombridge	0″.124	in	188°.8
Auwers	0.158	in	214.5
Porter	0.145	in	204.6
Paris	0.131	in	180.0
Newcomb	0.150	in	202.4
Boss	0.136	in	187.5

Oxford (Z 26°) 19211 (12.4)

R. A. $6^h\ 45^m\ 47^s.6$ Decl. + 25° 4′ 4″.2

This place for 1900 is from an Oxford astrographic plate taken 1908.08. From a comparison of this with an earlier plate, the proper motion is given:

0″.205 in 201°.0

A and B (10.5...12.0)

1910.760	107°.36	59″.99
.777	107.72	60.08
.780	107.28	60.51
1910.77	107.45	60.19

A and DM (25°) 1486 (9.5 m)

1910.760	107°.43	141″.20
.777	107.75	141.20
.780	107.08	141.60
1910.77	107.43	141.33

A and DM (25°) 1478 (8.5)

1910.8	Δ R. A. + 49ˢ.3	Δ Decl. + 76″.6	β
1900.	49.4	82.8	A. G.-Oxf.

The last comparison star is A 513.

Groombridge 1228 (6.0...11.3)

R. A. $6^h\ 47^m\ 44^s$ Decl. + 70° 58′

1910.049	356°.35	116″.82
.091	356.55	116.73
.093	356.48	117.50
1910.08	356.46	117.02

The large star has no sensible proper motion.

Groombridge 0″.022 in 163°.3

Probably unchanged. The prior measures are discordant in distance:

1878.24	356°.33	117″.96	1n	Bl
79.81	355.95	116.01	1n	Bl
79.83	355.58	117.41	1n	Bl
80.19	356.13	116.66	1n	Bl

39 Geminorum (6.4...12.4)

R. A. $6^h\ 51^m\ 27^s$ Decl. + 26° 14′

1910.760	28°.2	28″.35
.780	28.1	28.06
.835	27.6	28.21
1910.79	28.0	28.21

No other measures. The proper motion of 39 *Geminorum* is given:

Auwers	0″.198	in	294°.7
Boss	0.183	in	298.0

Nova Geminorum No. 2

R. A. $6^h\ 49^m\ 12^s$ Decl. + 32° 15′

A and C (3.8...12.0)

1912.197	98°.87	79″.46
.236	98.68	79.60
.255	98.78	79.60
1912.22	98.78	79.55

A and B (13.5)

1912.236	16°.3	11″.85
.255	15.1	11.83
1912.24	16.2	11.84

The first measure of the new star was made on the night of March 19 when the brightness was about maximum. At this time the new star was a most brilliant red. Later it had declined to about 6 m. The place given above is for 1912.

R *Geminorum* (Var...11.4)

R. A. $7^h\ 0^m\ 8^s$ Decl. + 22° 53′

1910.049	200°.10	172″.67
.093	200.75	172.30
1910.07	200.42	172.48

The principal star, which is variable, is DM (22°) 1577. Probably fixed.

1880.05	200°.26	173″.73	2n	Bl

Piazzi VI. 329 and 332 (8.0...8.0)

R. A. $7^h\ 1^m\ 9^s$ Decl. + 15° 43′

A and B

1908.102	98°.84	172″.07
.159	98.92	171.73
.192	98.50	172.03
1908.15	98.75	171.94

B and C (11.3)

1908.102	87°.05	88″.88
.159	87.12	88.95
.192	87.07	89.00
1908.15	87.08	88.94

The only direct measures of AB are:

1891.21	98°.65	172″.50	2n	Eng
1908.15	98.75	171.94	3n	β

Both stars are found in many of the star catalogues, from all of which it appears that there has been no relative motion. The relative positions in A. G. Berlin, Paris and Cincinnati, in connection with the more recent measures, show a common proper motion.

From transit positions the proper motions are given:

	A			B		
Porter	0″.222	in	191°.6	0″.214	in	190°4
A. G. Ber.	0.232	in	192.6	0.197	in	188.0
Paris	0.262	in	180.0	0.250	in	180.0

There are no other measures of the faint star C.

20 ***Monocerotis*** (5.8...12.9)

R. A. $7^h\ 4^m\ 16^s$ Decl. —4° 4′

A and B

1909.838	239°.23	55″.02
09.936	237.72	54.45
10.093	238.50	54.51
1909.96	238.48	54.66

A and C (10.7)

1909.838	339°.40	185″.99
09.936	339.00	186.21
10.093	339.05	186.31
1909.96	339.15	186.17

C and D (12.2)

1909.936	126°.05	85.47
10.093	126.05	85.64
1910.01	126.05	85.55

The proper motion of 20 *Monocerotis* is given:

Auwers	0″.207	in	358°.8
Paris	0.209	in	360.0
Porter	0.224	in	355.0
Boss	0.217	in	360.0

The following are the prior measures of AC:

1886.23	339°.62	190″.56	2n	Eng
1894.27	339.60	189.29	2n	Eng

A mean of these compared with the present position gives for the proper motion of the large star:

0″.205 in 361°.3

As a further check on the relative motion, I have measured a small star from each.

22 ***Monocerotis*** (4.2...13.7)

R. A. $7^h\ 5^m\ 44^s$ Decl. — 0° 18′

1910.780	170°.4	31″.83
10.933	169.7	32.12
11.142	170.3	32.09
1910.95	170.1	32.01

The faint companion first noted by Jonckheere. No other measures. The proper motion of the large star, if any, is small:

Auwers	0″.034	in	322°.1
Boss	0.011	in	344.8

Bradley 1048 (7.3...10.8)

R. A. $7^h\ 7^m\ 7^s$ Decl. + 24° 55′

A and B

1907.807	107°.70	127″.62
.845	107.88	127.07
.848	107.85	127.61

The other measures are:

1886.20	107°.65	127″.52	2n	Eng
1894.24	107.70	127.54	2n	Eng
1907.82	107.81	127.43	3n	β

It is a little strange that the distant small star should have exactly the same proper motion as the large star, if that motion is real as shown by meridian observations:

Auwers	0″.103	in	312°.6
Boss	0.016	in	184.9

To show this, I have connected each with a fainter star in the field. It is very probable that A and B have no sensible motion.

A and *a* (11.6)

1907.845	17°.93	49″.12
.848	17.55	49.23
.865	16.87	48.67
1907.85	17.45	49.01

B and *b* (11.0)

1907.845	192°.75	93″.15
.848	192.42	93.54
.865	192.77	93.50
1907.85	192.65	93.40

Oxford (Z 26°) 20428 (8.2)

R. A. $7^h\ 7^m\ 49^s.15$ Decl. + 25° 10′ 58″.7

This is identical with the 8.3 m star, DM (25°) 1613. The place given here for 1900 is from an Oxford astrographic plate taken 1908.08. Compared with a prior plate, the proper motion is:

0″.368 in 255°.7

A and B (11.9)

1910.760	156°.21	50″.65
.780	155.96	50.16
.856	155.63	50.03
1910.80	155.93	50.28

A and DM (25°) 1612 (9.4)

1910.85	249°.23	227″.41	β
1855.	252.	252.	DM

The last star is not in A. G.

44 ***Cameloparadalis*** (7.5...11.1)

R. A. $7^h\ 8^m\ 14^s$ Decl. + 59° 8′

1910.148	7°.45	168″.91
.164	7.64	169.22
.203	7.32	168.76
1910.17	7.47	168.96

Change in angle from proper motion.

1878.52	6°.28	168″.85	2n	Bl

The proper motion of A is small:

Auwers	0″.082	in	248°.6
Groombridge	0.033	in	254.4

DM (22°) 1620 (7.2...10.0)

R. A. $7^h 8^m 23^s$ Decl. + 22° 10′

1908.769	263°.30	94″.49
.788	264.03	94.52
.843	263.90	94.88
1908.80	263.74	94.63

The only prior measures are:

1879.52	263°.50	95″.40	2n	Bl

Further observations are needed. The principal star has been called red, but only yellowish now.

Oxford (Z 26°) 20681 (10.1)

R. A. $7^h 10^m 46^s.57$ Decl. + 27° 3′ 32″.8

This is the 9.2 m star, DM (27°) 1350. The place for 1900 is from the Oxford Astrographic plate taken 1908.08. From a comparison with an earlier plate the proper motion is found:

0″.151 in 180°.0

A and C (9.9...12.7)

1910.760	134°.93	29″.02
.780	134.73	29.34
.856	135.97	29.46
1910.80	135.21	29.27

There is a 14.5 m star 8″ or 10″ from A.

η *Canis Majoris* (2.5...8.0)

R. A. $7^h 19^m 21^s$ Decl. — 29° 4′

1909.206	285°.12	178″.72
.227	285.35	178.71
1909.22	285.23	178.71

The only prior measure is the following:

1880.00	285°.0	178″.65	2n	β^2

Obviously these stars have no proper motion. This is also apparent from the meridian observations:

Auwers	0″.030	in	298°.0
Newcomb	0.008	in	31.0
Boss	0.010	in	293.6

There is a large error in the relative positions from the Washington zones.

1849	285°.7	185″.3	Wash. Z.
1875	285.5	178.6	Cord. G. C.

β *Canis Minoris*

R. A. $7^h 20^m 39^s$ Decl. + 8° 32′

A and C (11.2)

1907.772	23°.43	98″.05
7.810	23.23	98.23
7.997	23.35	98.94
8.000	23.48	98.69

A and D (11.1)

1907.772	76°.40	124″.75
.810	76.40	125.22
.997	76.93	124.74

A and E (10.9)

1907.810	310°.93	138″.83
7.997	311.02	138.29
8.000	311.18	139.05

The results of all the measures are:

AC	1879.98	22°.70	97″.02	1n	β^2
	1907.89	23.37	98.48	4n	β
AD	1879.99	76.70	123.15	2n	β
	1907.86	76.58	124.90	3n	β
AE	1879.99	309.95	138.98	2n	β
	1907.86	311.04	138.72	3n	β

From these measures the motion of A is:

AC	R. A. — 0″.058	Decl. — 0″.032
AD	.059	.023
AE	.066	.068
	—0.061	—0.041

Giving for the proper motion of β *Canis Minoris:*

0″.073 in 236°.1

From meridian positions we have:

Auwers	0″.069	in	247°.1
Newcomb	0.066	in	225.4
Boss	0.066	in	229.6

22 *Lyncis* (5.5...10.3)

R. A. $7^h 20^m 49^s$ Decl. + 49° 54′

1909.703	303°.78	169″.17
.722	303.70	169.42
.744	303.70	169.20
1909.72	303.73	169.26

The small star has been previously measured as follows:

1888.29	303°.87	165″.92	2n	Eng
1894.25	303.77	167.27	2n	Eng

From the change shown in these observations, Engelhardt inferred that the small star, after allowing for the accepted movement of 22 *Lyncis,* had a large proper motion of 0″.190, and evidently this must be the case if the measures were substantially correct; or else the motion of the large star as derived from meridian observations is much too small. As the chances are enormously against a star of this magnitude having any sensible movement, it was carefully re-measured. Obviously the suspected motion is not confirmed by the recent observations. One or the other of the early positions must be affected by a considerable error, accidental or otherwise. If we reject the first, and compare the other with the results given above, we have substantially the proper motion of A as given in the star catalogues.

Measures	0″.129	in	120°.8
Groombridge	0.135	in	124.8
Auwers	0.089	in	154.3
Boss	0.145	in	125.8

Therefore it is practically certain that the small star, like nearly all other of this magnitude, has no sensible movement. This will appear independently hereafter from the following:

B and C (12.0)

1909.744	150°.17	110″.64
.760	150.05	111.07
.763	150.28	110.82
1909.75	150.17	110.84

62 *Geminorum* (4.5...10.6)

R. A. $7^h 21^m 34^s$ Decl. $+32° 1'$

A and B

1909.780	291°.10	214″.06
.818	291.20	213.95
.821	291.06	213.16
.838	291.40	213.33
1909.81	291.19	213.63

This star has been previously measured as follows:

1886.22	292°.85	211″.56	2n	Eng
1894.25	292.15	212.57	2n	Eng

As these two positions showed a much larger relative change than could be accounted for by the accepted proper motion of 62 *Geminorum*, Englehardt inferred (A. N. 3373) that the small star had a motion of 0″.152 in the direction of 239°.

The recent measures do not support this change, and are not accordant with one or the other of the early positions. It would appear probable that there is some accidental or other error in one. A comparison of the position of 1886 with that of 1909 gives for the proper motion of 62 *Geminorum:*

0″.225 in 45°.2

This is in substantial agreement with the values found from meridian observations:

Auwers (Brad.)	0″.227	in	31°.3
Auwers (F. C.)	0.238	in	34.5
Paris	0.248	in	34.7
Boss	0.236	in	39.1

As a further test of any motion in B I have connected a third faint star.

B and C (12.2)

1909.821	267°.10	104″.59
.838	267.33	103.76
.859	267.14	104.07
1909.84	267.19	104.07

Aitken has recently discovered a close companion to the principal star:

1910.19	11°.4	2″.80	2n	A

υ *Geminorum* (4.2...13.2)

R. A. $7^h 28^m 32^s$ Decl. $+27° 10'$

1911.104	45°.8	46″.13
.145	45.9	46.24
.164	45.4	45.94
1911.13	45.7	46.10

No other measures. The proper motion of the large star is given:

Auwers	0″.105	in	196°.9
Boss	0.119	in	193.0
Newcomb	0.111	in	191.1

25 *Monocerotis* (5.0...10.7)

R. A. $7^h 31^m 19^s$ Decl. $-3° 51'$

A and C

1909.838	349°.67	121″.62
.859	349.57	121.86
.933	349.49	121.74
1909.88	349.58	121.74

The small star is SD (3°) 1978 (9.8). The previous measures are:

1887.18	349°.07	122″.70	2n	Eng
1894.27	349.38	122.38	2n	Eng

A mean of the first two measures compared with the last indicates a smaller proper motion of 25 *Monocerotis* than that given from meridian observations.

Measures	0″.058	in	305°.4
Auwers	0.124	in	284.5
Boss	0.073	in	284.4

The measures should be repeated later on. As a further check on the motion, I have measured one of the nearer stars.

A and B (13.0)

1909.838	267°.9	28″.48
.859	266.4	28.22
.933	266.7	27.94
1909.88	267.0	28.21

σ 75 *Geminorum* (4.5...11.0)

R. A. $7^h 35^m 49^s$ Decl. $+29° 10'$

1909.818	316°.37	182″.30
.821	316.33	182.13
.859	316.57	182.09
1909.83	316.42	182.17

The earlier measures are much too discordant in distance to be made use of at this time in finding the proper motion of the large star. Evidently the mean value cannot be used. Further measures, after a suitable time interval, should be made.

1877.29	315°.48	178″.40	1n	Bl
1877.84	315.05	177.91	1n	Bl
1878.83	315.25	179.57	1n	Bl

The proper motion of 75 *Geminorum* is given:

Auwers	0″.230	in	165°.2
Paris	0.204	in	156.5
Porter	0.234	in	165.4
Boss	0.247	in	163.7

S Geminorum (Var...11.1)

R. A. $7^{h}\ 35^{m}\ 50^{s}$ Decl. + 23° 44′

1909.818	122°.87	70″.41
09.933	122.73	70.72
10.091	123.15	70.03
1909.95	122.92	70.38

The principal star, DM (23°) 1796, is variable. For comparison we have:

1878.24	120°.88	70″.32	1n	Bl
1878.88	121.85	69.34	1n	Bl

DM (33°) 1587 (7.5...11.6)

R. A. $7^{h}\ 40^{m}\ 24^{s}$ Decl. + 33° 9′

1908.769	45°.01	44″.42
.785	45.30	44.25
.788	44.93	44.68
1908.78	45.08	44.45

The only prior measures are too discordant in distance for any inference as to real change.

1879.31	47°.21	44″.29	1n	Bl
.83	46.78	43.34	1n	Bl

Oxford (Z 26°) 22647 (11.0)

R. A. $7^{h}\ 40^{m}\ 44^{s}.93$ Decl. + 26° 57′ 27″.2

This star is identical with DM (27°) 1477 (9.5). The place (for 1900) is from an astrographic plate taken 1908.08. The Oxford proper motion is:

0″.165 in 201°.9

A and B (9.6...12.7)

1910.777	295°.35	45″.26
.856	294.47	44.97
.933	295.00	44.98
1910.86	294.94	45.07

A and C (11.8)

1910.777	189°.85	55″.96
.856	189.80	54.79
.933	189.77	55.41
1910.86	189.81	55.39

A and DM (27°) 1470

1910.8	Δ R. A. — $59^{s}.8$	Δ Decl. + 35″.9	β
1900	60.0	36.2	A. G. — Oxf.

Lalande 15219 (6.2...6.7)

R. A. $7^{h}\ 42^{m}\ 18^{s}$ Decl. — 15° 43′

A and C

1909.167	311°.04	128″.42
.170	310.75	128.96
.186	311.05	128.66
1909.17	310.95	128.68

In the first measures the distances differ as much as 1″.3, so the close agreement with the present result is rather accidental.

1864.22	310°.68	128″.76	3n	Kn

I do not find any proper motion assigned to either of these stars. The smaller is Lalande 15213. Some of the meridian positions are:

1877	310°.7	128″.9	Cord. G. C.
1895	311.1	129.0	A. G. Wash.

I have measured a new companion to the principal star:

A and B (13.7)

1909.167	54°.8	10″.64
.170	54.4	10.38
.186	53.4	10.55
1909.17	54.2	10.52

Piazzi VII. 215 (6.5...10.7)

R. A. $7^{h}\ 43^{m}\ 19^{s}$ Decl. + 33° 32′

1909.821	145°.88	78″.02
09.933	145.71	78.05
10.093	145.98	77.93
1909.95	145.86	78.00

The early measures are discordant in distance. Probably fixed.

1878.90	145°.65	78″.28	1n	Bl
1879.35	145.50	77.14	1n	Bl

Oxford (Z 26°) 22642 (10.9)

R. A. $7^{h}\ 45^{m}\ 14^{s}.33$ Decl. + 26° 52′ 21″.7

This place (for 1900) is from a plate of the Oxford *Astrographic Catalogue* taken 1908.08. From a comparison of this with an earlier photograph, the proper motion is given:

0″.184 in 146°.0

There are no catalogue stars near enough for direct comparison with the micrometer.

A and B (9.9...10.9)

1910.777	306°.58	182″.25
.933	306.28	182.49
1910.85	306.43	182.37

A and C (10.8)

1910.777	254°.82	192″.73
.933	254.90	191.20
1910.85	254.86	191.96

Lalande 15290 (8.2...13.3)

R. A. $7^{h}\ 45^{m}\ 53^{s}$ Decl. + 30° 58′

1908.326	4°.80	67″.11
.900	4.20	67.96
.974	3.95	67.87
1908.73	4.32	67.65

No other measures. This star has a large proper motion:

Stumpe	1″.952	in	157°.4
Porter	1.947	in	158.7

Lalande 15394 (7.9...10.1)

R. A. $7^h 47^m 55^s$ Decl. + 19° 34′

A and B

1907.788	255°.03	86″.82
.807	255.31	86.38
.845	255.40	86.36
1907.81	255.25	86.52

A and C (10.4)

1907.788	85°.30	122″.45
.807	85.48	122.26
.845	85.58	122.48
1907.81	85.45	122.40

A and *a* (11.6)

1907.807	36°.63	36″.75
.845	36.60	36.84
1907.82	36.61	36.80

The other measures are:

AB	1893.24	250°.97	88″.06	2n	Eng
AC	1893.24	89.02	124.01	2n	Eng

The proper motion of the principal star from the measures of both companions is:

0″.497 in 170°.4

It is given from transits:

Stumpe	0″.416	in	164°.9
Porter	0.446	in	167.2

There are no other measures of the small star near A.

Oxford (Z 26°) 23412 (10.1)

R. A. $8^h 0^m 55^s.78$ Decl. + 25° 49′ 24″.2

From the Oxford *Astrographic Catalogue;* place for 1900 from plate taken 1908.08. This is the 9.2 m star, DM (25°) 1848. The Oxford proper motion is:

0″.203 in 190°.3

A and B (9.2...12.2)

1910.835	10°.45	112″.82
.856	10.75	112.81
.931	11.51	112.96
1910.87	10.90	112.86

A and DM (25°) 1849 (9.5)

1910.835	130°.08	254″.79
.856	129.67	254.95
.931	129.98	255.65
1910.87	129.91	255.13

The last comparison star is not in A. G. The DM places give, 131° : 248″. While this is only roughly approximate, it is worthy of note that the proper motion of A would change the angle, and not the distance sensibly.

ψ^1 ***Cancri*** (7.0...10.0)

R. A. $8^h 2^m 58^s$ Decl. + 26° 12′

1910.835	50°.93	87″.50
.856	50.87	87.73
.931	50.85	87.54
1910.87	50.88	87.59

No other measures. The proper motion of the bright star is:

Auwers	0″.070	in	231°.4
Boss	0.089	in	244.8

ψ^2 ***Cancri*** (6.1...12.5)

R. A. $8^h 3^m 13^s$ Decl. + 25° 52′

A and B

1910.835	293°.51	73″.76
.856	293.30	73.92
.931	293.55	73.43
1910.87	293.45	73.70

A and C (11.0)

1910.835	211°.91	117″.66
.856	210.93	117.48
.931	211.76	116.88
1910.87	211.53	117.34

No other measures. The proper motion is:

Auwers	0″.364	in	195°.4
Boss	0.363	in	192.9

Piazzi VII. 321 (7.0...11.0)

R. A. $8^h 4^m 7^s$ Decl. + 32° 50′

A and B

1907.807	320°.77	53″.27
8.022	321.90	53.40
8.063	321.25	53.48

A and C (10.4)

1907.807	75°.70	225″.21
8.022	75.70	225.37
8.063	75.83	225.51

We have the following measures:

AB	1857.26	280°.10	58″.04	1n	OΣ
	1881.28	298.72	52.83	1n	OΣ
	1907.96	321.31	53.38	3n	β
AC	1850.72	83.95	193.04	2n	OΣ
	1857.26	82.73	197.00	1n	OΣ
	1881.28	78.97	210.46	1n	OΣ
	1907.96	75.74	225.36	3n	β

These positions give the motion of A:

AB	R. A. — 0″.469	Decl. — 0″.623
AC	0.461	0.617
	— 0.465	— 0.620

Hence the corrected proper motion is:

0″.775 in 216°.9

Meridian positions give:

Porter	0″.811	in	216°.9
Paris	0.814	in	213.2
Kustner	0.807	in	217.0
Boss	0.808	in	214.7

Lalande 15976 (7.5...9.0)

R. A. $8^h 6^m 32^s$ Decl. + 57° 28′

A and B

1907.791	161°.28	131″.83
.810	161.86	132.21
.964	161.88	132.37
1907.85	161.67	132.14

B and C (11.0)

1907.810	152°.61	100″.39
7.964	152.62	100.12
8.769	152.60	100.64
8.785	153.58	100.40
1908.33	152.85	100.39

It is not probable that B has any sensible proper motion. For greater certainty hereafter, I have connected a third faint star. The measures of AB are:

1893.25	164°.37	134″.28	2n	Eng
1907.85	161.67	132.14	3n	β

Combining these positions with that in A. G. Hels. for 1871, to give a longer time interval, we have for the proper motion of the large star:

0″.432 in 230°.4

Some of the meridian values are:

Stumpe	0″.408	in	230°.1
Porter	0.394	in	232.3
Paris	0.359	in	227.6

Bradley 1169 (7.3...9.2)

R. A. $8^h 7^m 2^s$ Decl. + 59° 31′

A and B

1909.071	8°.80	96″.32
.091	8.97	95.88
.093	9.25	96.16
1909.08	9.01	96.12

A and C (8.6)

1909.071	308°.20	223″.96
.091	308.23	223.78
.093	308.42	223.54
1909.08	308.28	223.76

A and D (9.2)

1909.071	63°.30	236″.74
.091	63.50	236.63
.093	63.18	236.33
1909.08	63.33	236.57

We have the following earlier measures of B and C:

AB	1851.27	8°.50	95″.02	1n	OΣ
	1879.81	8.75	95.68	1n	Doub.
AC	1851.27	308.37	222.41	1n	OΣ
	1879.81	308.25	223.00	1n	Doub.

These measures give for the annual movement of the principal star:

AB	R. A. — 0″.017	Decl. — 0″.015
AC	0.020	0.013
	0.018	0.014

The value derived from meridian positions seems to be too large:

Measures	0″.023	in	232°.1
Auwers	0.045	in	228.5
Boss	0.038	in	165.0

The distances in the early measures of AD are inconsistent with each other, and with the later results. Unfortunately the Pulkowa positions depend upon a single night, and therefore may have some accidental error. The meridian positions are still more uncertain. The several values of the relation of these stars are as follows:

A and D

1842.	62°.3	236″.5		O. Arg. N.
1851.27	62.81	234.98	1n	OΣ
1873.	63.1	238.0		A. G. Hels.
1879.81	63.00	234.88	1n	Doub.
1908.08	63.33	236.57	3n	β

It is evident that no use can be made of these positions for getting the relative motion. They are too inconsistent to warrant the selection of one or more of them at this time, and the rejection of the others. It may be that the small star has some proper motion of its own. Measures in the future will settle this question.

With this in view I have connected it with two small stars:

D and E (9.7)

1909.109	107°.90	156″.02
.112	108.27	155.75
.128	108.03	155.64
1909.11	108.07	155.80

D and F (11.2)

1909.112	166°.47	173″.23
.128	166.20	172.88
1909.12	166.33	173.05

The three comparison stars B, C, and D are respectively DM (59°) 1153, 1152, and 1155. The magnitudes given are those of the DM.

Oxford (Z 26°) 24255 (9.6)

R. A. $8^h 16^m 24^s.71$ Decl. + 26° 57′ 12″.8

From the Oxford *Astrographic Catalogue;* plate taken 1908.19. Place for 1900. From this and an earlier exposure, the proper motion is given:

0″.164 in 192°.7

This is identical with the 8.8 m star, DM (27°) 1598.

A and B (12.4)

1911.164	219°.90	46".52
.200	219.85	45.89
1911.18	219.87	46.20

Oxford (Z 26°) 24256 (9.8)

R. A. $8^h\ 16^m\ 50^s.66$ Decl. + 27° 0′ 17".0

This is closely following the last star, and is the 9.4 m star DM (27°) 1600. Place for 1900. The Oxford proper motion is:

0".163 in 240°.5

A and B (13.0)

1911.164	226°.3	30".75

Oxford 24255 and 24256

1908.18	Δ R. A. + $25^s.95$	Δ Decl. + 184".2	Oxf.
1911.14	25.97	183.7	β

Oxford (Z 26°) 23968 (11.3)

R. A. $8^h\ 17^m\ 24^s.59$ Decl. + 25° 28′ 36".6

The place for 1900 is from an astrographic plate taken 1908.19. From a comparison of this with an earlier photograph, the proper motion is found:

0".260 in 180°.0

This is identical with the 9.1 m star, DM (25°) 1910.

A and B (9.5...11.5)

1910.142	174°.23	146".05

Lalande 16494 (7.5...9.5)

R. A. $8^h\ 18^m\ 26^s$ Decl. — 0° 45′

1907.845	44°.75	153".83
7.865	44.58	154.10
8.022	44.80	153.85

The measures are:

1891.21	45°.52	153".28	2n	Eng
1907.91	44.71	153.93	3n	β

These positions give for the proper motion of A:

0".132 in 152°.4

This is considerably smaller than that given from meridian positions:

Stumpe	0".271	in	147°.2
Porter	0.220	in	149.7
A. G. Nico.	0.235	in	151.4

As it is very improbable that B has a proper motion of more than 0".1, I have measured a third very faint star.

B and C (13.2)

1907.865	12°.17	65".48
8.022	14.00	66.59
8.102	13.53	66.69
1908.00	13.23	66.25

δ ***Hydrae*** (4.4...10.6)

R. A. $8^h\ 31^m\ 18^s$ Decl. + 6° 7′

1909.093	312°.22	243".77
.170	311.94	243.50
.186	311.98	243.56
1909.15	312.05	243.61

The small star is DM (6°) 1997 (9.3). The only other position of this depends upon a single measure:

1879.25	311°.5	243".88	1n	β^2

The proper motion of the large star is given from meridian observations:

Auwers	0".097	in	269°.1
Newcomb	0.072	in	258.6
Boss	0.074	in	261.5

39 and 40 *Cancri* (6.7...6.9)

R. A. $8^h\ 33^m\ 12^s$ Decl. + 20° 26′

A and B

1907.845	151°.13	149".61
8.000	151.05	149.53
8.022	151.23	149.42
1907.95	151.14	149.55

A and *a* (9.1)

1907.845	309°.05	133".61
8.000	309.48	134.30
8.022	309.23	134.19
1907.95	309.25	134.03

A and *b* (9.0)

1907.845	110°.68	135".23
8.000	110.47	134.91
8.022	110.90	135.19
1907.95	110.68	135.11

B and *c* (10.8)

1907.845	147°.82	139".30
8.000	147.33	139.21
8.022	147.72	139.57
1907.95	147.62	139.36

Some of the recent positions of the large stars, including all the direct measures are:

1881.4	151°.4	150".1		A. G. Berlin
1887.27	151.25	149.75	2n	Eng
1894.2	151.2	150.3		Greenwich
1907.95	151.14	149.55	3n	β

It is evident from these positions that the relative change, if any, is less than the usual errors of the observations.

The proper motion from transit positions are given:

39 *Cancri*	0".107	in	279°.7	Auwers
	0.041	in	247.0	Hedrick
	0.044	in	239.9	Boss
40 *Cancri*	0.065	in	291.7	Auwers
	0.020	in	261.7	Hedrick
	0.037	in	242.3	Boss

For the small stars near A we have:

A and *a*

1887.27	309°.13	134″.17	2n	Eng
1894.23	309.15	134.10	2n	Eng
1907.95	309.25	134.03	3n	β

A and *b*

1887.27	110°.50	135″.03	2n	Eng
1894.23	110.50	134.92	2n	Eng
1907.95	110.68	135.11	3n	β

Obviously there is no certain change. It is somewhat remarkable that these small and distant stars should have the same movement as the large star if the motion of that is large enough to be approximately determined in the time interval. Later measures will show this, and the relative motion of AB. There are no other measures of the small star near B.

Lalande 17046 (8.1...9.5)

R. A. 8ʰ 33ᵐ 17ˢ Decl. + 11° 58′

A and B

1907.769	323°.70	135″.71
.807	323.91	135.47
.810	323.63	135.23
1907.79	323.75	135.47

B and C (11.1)

1907.769	12°.77	30″.43
.807	13.23	30.30
.810	13.36	30.37
1907.79	13.12	30.37

No other measures of C. B is DM (12°) 1887. The prior measures are:

1891.22	321°.05	130″.20	2n	Eng
1907.79	323.75	135.37	3n	β

The change in the proper motion is small:

Measures	0″.490	in	192°.8
Stumpe	0.542	in	198.0
Porter	0.511	in	198.2
Paris	0.502	in	180.0

γ *Cancri* (5.0...9.2)

R. A. 8ʰ 36ᵐ 20ˢ Decl. + 21° 54′

A and B

1907.845	66°.02	104″.51
7.865	65.93	104.33
8.022	66.25	105.03
8.159	66.05	104.78
1907.97	66.04	104.66

A and *a* (13.0)

1907.865	257°.23	103″.20
8.022	257.70	103.97
8.063	257.75	102.70
8.159	257.55	103.16
1908.03	257.56	103.26

B and *b* (13.5)

1907.865	101°.67	95″.03
8.249	101.72	94.22
8.291	102.65	94.49
1908.13	102.01	94.58

The measures of AB are:

1888.27	65°.77	102″.96	2n	Eng
1894.23	65.83	103.56	2n	Eng
1907.97	66.04	104.66	4n	β

A mean of the first two compared with the last gives for the proper motion of the large star:

0″.087 in 262°.7

The meridian observations give a larger motion:

Auwers	0″.125	in	254°.8
Paris	0.115	in	252.8
Newcomb	0.108	in	246.3
Boss	0.113	in	243.8

It is practically certain that B has no sensible motion. To show this independently I have measured very small stars from both A and B.

S *Cancri* (Var...10.8)

R. A. 8ʰ 37ᵐ 5ˢ Decl. + 19° 28′

1908.974	270°.03	74″.65
9.109	269.60	75.18
9.128	269.53	75.18
1909.07	269.72	75.00

The principal star is not known to have any proper motion. The difference in the measures is probably accounted for by errors of observation.

1878.32	269°.27	76″.16	1n	Bl
1879.86	268.59	77.04	1n	Bl

Piazzi VIII. 174 (8.0...9.3)

R. A. 8ʰ 43ᵐ 45ˢ Decl. + 48° 1′

A and B

1907.810	321°.55	164″.02
8.291	321.55	164.64
8.326	321.85	164.46
1908.14	321.65	164.37

A and C (9.4)

1907.810	280°.28	221″.55
8.291	280.48	221.79
8.326	280.40	221.62
1908.14	280.39	221.65

B and C

1908.291	232°.65	146″.38
1908.14	232.54	146.20

The second position of BC is computed from the measures of AB and AC. B and C are respectively DM (48°) 1692 and 1691.

With prior positions we have:

AB	1873.2	320°.8	155″.9		A. G. Bonn
	1893.24	321.38	161.77	2n	Eng
	1908.14	321.65	164.37	3n	β
AC	1893.24	279.68	220.43	2n	Eng
	1908.14	280.39	221.65	3n	β

The measures give for the proper motion of the large star:

AB	R. A. + 0″.068	Decl. — 0″.168
AC	0.049	0.192
	0.058	0.180

Therefore the proper motion of A is:

0″.189 in 162°.1

The meridian observations give a larger value:

Stumpe	0″.250	in	175°.6
Paris	0.264	in	180.0
Porter	0.226	in	180.0

There is certainly some motion in R. A. Combining the A. G. Bonn position with the measures of AB gives:

0″.234 in 155°.3

DM (20°) 2243 (9.0...11.2)

R. A. $8^{h}\ 49^{m}\ 49^{s}$ Decl. + 20° 19′

1908.769	253°.88	140″.92
.898	254.10	140.99
.974	254.20	140.78
1908.88	254.06	140.90

The principal star is red and variable. The only other position is:

1878.61	254°.05	141″.78	2n	Bl

10 *Ursae Majoris* (4.2...9.6)

R. A. $8^{h}\ 52^{m}\ 51^{s}$ Decl. + 42° 15′

A and B

1907.788	200°.22	130″.06
8.000	200.30	129.77
8.022	200.40	129.84

A and C (10.5)

1908.022	108°.90	223″.36
.063	109.00	222.97

The following are all the measures:

A and B

1851.76	206°.32	150″.33	2n	OΣ
1881.29	203.48	139.64	1n	OΣ
1884.36	203.40	138.63	2n	HΣ
1888.27	202.48	136.46	2n	Eng
1907.94	200.31	129.89	3n	β

A and C

1851.18	114°.35	204″.65	1n	OΣ
1881.29	111.07	214.96	1n	OΣ
1908.04	108.95	223.16	2n	β

From these positions the corrected proper motion of the large star is:

AB	R. A. — 0″.384	Decl. — 0″.231
AC	0.434	0.210
	0.409	0.221

This movement is therefore:

0″.465 in 241°.6

The motion from transits is too large:

Auwers	0″.515	in	239°.8
Groombridge	0.510	in	245.1
Paris	0.512	in	237.6
Newcomb	0.502	in	239.0
Boss	0.504	in	238.8

I have measured another star from A:

A and *a* (10.8)

1908.000	119°.35	141″.87
.022	119.93	142.09
.063	119.93	141.65
1908.03	119.74	141.87

The only other position of this is from the *Astrographic Catalogue:*

1893.30	121°.7	140″.04	Donner

75 *Cancri* (6.2...9.3)

R. A. $9^{h}\ 1^{m}\ 43^{s}$ Decl. + 27° 7′

A and B

1907.807	39°.83	110″.86
8.022	39.93	110.88
8.025	39.92	110.85
1907.95	39.89	110.86

B and C (10.5)

1907.807	337°.96	128″.66
8.022	338.20	129.31
8.025	338.17	128.57
1907.95	338.11	128.85

The prior measures of B are:

1851.73	43°.25	92″.60	2n	OΣ
1861.27	42.60	95.86	1n	OΣ
1879.18	41.12	101.60	3n	Doubiago
1887.38	40.97	104.29	2n	Eng
1907.95	39.89	110.86	3n	β

From these positions the proper motion of 75 *Cancri* is:

0″.341 in 203°.3

This has been given from meridian observations:

Auwers	0″.402	in	200°.0
Porter	0.398	in	200.0
Boss	0.404	in	196.7

As evidence of the fixity in space of B, I have measured a third star. The small star B is DM (27°) 1716. My later measures are:

1911.222	39°.83	111″.89
.260	39.42	112.21
1911.24	39.62	112.05

80 *Cancri* (6.5...9.1)

R. A. $9^h\ 5^m\ 13^s$ Decl. + 18° 32′

1908.862	252°.02	133″.33
.882	251.82	133.08
.974	252.08	132.93
1908.90	251.97	133.11

For comparison we have:

1870.5	251°.3	133″.7		A. G. Ber.
1882.34	251.95	134.62	1n	OΣ
1908.90	251.97	133.11	3n	β

There is evidently considerable error in the meridian positions if the micrometer measures are substantially correct. The latter give for the apparent motion of 80 *Cancri:*

0″.057 in 250°.7

The proper motion of the large star is given:

Auwers	0″.076	in	264°.0
Boss	0.045	in	228.7

I have measured the third star from B. These stars are DM (18°) 2137 and 2136, the latter 9.6 m.

B and C

1909.071	317°.17	148″.36
.112	317.17	147.79
.164	317.07	148.47
1909.11	317.14	148.21

π^1 81 *Cancri* (6.5...13.3)

R. A. $9^h\ 5^m\ 43^s$ Decl. + 15° 29′

A and B

1907.845	118°.05	35″.30
8.022	119.10	35.26
8.102	117.97	35.67
1907.99	118.37	35.41

A and C (9.5)

1907.845	229°.25	222″.10
8.000	229.20	222.67
8.022	228.97	222.41
1907.96	229.14	222.39

No other measures of B. C is DM (15°) 2001. Of this we have the following measures:

1855.25	235°.58	237″.11	1n	OΣ
1870.28	233.68	232.58	1n	OΣ
1882.34	232.23	228.06	1n	OΣ
1907.96	229.14	222.39	3n	β

From which the proper motion of A is:

0″.563 in 292°.4

The meridian positions give:

Auwers	0″.606	in	294°.3
Hedrick	0.573	in	295.1
Boss	0.575	in	294.1

Bradley 1300 (6.2...9.7)

R. A. $9^h\ 8^m\ 12^s$ Decl. + 35° 8′

1911.947	261°.97	152″.64
12.066	261.73	152.49
1912.00	261.85	152.56

No other measures. The proper motion of Bradley 1300 is:

Auwers	0″.162	in	290°.2
Boss	0.149	in	283.2

DM (23°) 2063 (7.5...9.0)

R. A. $9^h\ 8^m\ 15^s$ Decl. + 23° 53′

A and C

1908.785	82°.87	60″.38
.882	82.40	60.23
.974	82.63	60.49
1908.88	82.63	60.37

The prior measures give:

1841.23	87°.50	51″.19	1n	OΣ
1881.26	83.95	56.58	1n	OΣ
1881.24	84.40	56.63	3n	Doub.
1908.88	82.63	60.37	3n	β

From these positions we have for the proper motion of the large star:

0″.153 in 237°.5

The value derived from meridian observations appears to be too large.

Porter	0″.204	in	224°.8
A. G. Ber.	0.194	in	223.9

It is not likely that the small star has any sensible movement. To be certain of this hereafter, I have connected a faint star:

A and B (10.7)

1908.785	169°.93	59″.75
8.974	170.75	59.70
9.071	170.83	59.98
1908.94	170.50	59.81

40 *Lyncis* (3.4...8.6)

R. A. $9^h\ 13^m\ 44^s$ Decl. + 34° 54′

A and B

1908.060	37°.35	210″.35
.082	37.09	210.10
.159	37.18	210.30
1908.10	37.21	210.25

B and C (= Σ 1342)

1908.060	321°.9	16″.85
.082	321.0	16.86
.159	321.1	17.02
1908.10	321.3	16.91

We have the following micrometer positions of AB:

1851.18	33°.73	204".15	1n	OΣ
1861.27	34.57	205.32	1n	OΣ
1870.30	34.97	205.92	1n	OΣ
1881.29	35.65	207.62	1n	OΣ
1886.34	36.05	208.05	2n	Eng
1908.10	37.21	210.25	3n	β

These positions give for the most probable motion of A:

0".244 in 279°.1

The measures of BC given above when compared with Struve in 1830, show a slow relative motion which is undoubtedly real. As the smaller component of Σ 1342 is only 11 m, it is safe to assume that the proper motion is in the other star. This motion is therefore:

0".025 in 24°.0

Applying this correction to the apparent motion of 40 *Lyncis*, we have for the real proper motion of that star:

0".238 in 285°.0

From meridian observations this has been given:

Stumpe	0".250	in	276°.7
Auwers	0.239	in	276.3
Newcomb	0.219	in	273.1
Boss	0.217	in	272.6

ψ *Leonis* (5.6...10.9)

R. A. $9^h 37^m 12^s$ Decl. + 14° 34′

1909.071	137°.97	281".76
.112	138.13	282.08
.186	138.08	281.71
1909.12	138.06	281.85

All single distances. The only other measure is the following:

1880.17	139°.63	280".26	3n	β^s

The distance between the two stars is too large for the most accurate measures with the micrometer. These observations imply a larger proper motion of the large star than that found by meridian positions.

Auwers	0".013	in	261°.3
Newcomb	0.030	in	252.2
Boss	0.014	in	191.7

20 *Leonis Min* (5.6...8.8)

R. A. $9^h 54^m 6^s$ Decl. + 32° 31′

There is no comparison star near enough for direct measurement with the micrometer. Otto Struve compared it in R. A. and Decl. with DM (52°) 1968, which is about 33^s following.

The several results are:

1852.19	Δ Decl. — 31".92	1n	OΣ
1873.27	— 23.96	1n	OΣ
1909.16	— 9.24	3n	β

Therefore the proper motion of the large star in declination is:

Measures	— 0".425
Porter	0.427
Auwers	0.432
Boss	0.441

Lalande 19627 (8.8...9.4)

R. A. $9^h 59^m 9^s$ Decl. + 69° 2′

1907.810	255°.25	183".24
8.079	255.33	183.27
8.082	255.25	183.08
1907.99	255.28	183.20

The only other measures are:

1893.25	255°.33	186".78	2n	Eng

Giving for the motion of A:

0".243 in 257°.9

As these stars differ but little in brightness, it is uncertain whether or not the motion is all in the larger.

The results from meridian positions are discordant.

Stumpe	0".411	in	219°.5
Porter	0.303	in	237.0

To determine hereafter whether there is any motion in B, I have connected a third star:

B and C (12.0)

1912.066	325°.40	198".09
.162	325.50	198.16
.164	325.13	197.49
1912.13	325.34	197.91

A and B are DM (69°) 558 and 557.

Groombridge 1618 (6.7...8.8)

R. A. $10^h 4^m 0^s$ Decl. + 50° 4′

1908.025	191°.58	172".41
.102	191.23	172.37
.118	191.38	172.09

The only measured positions are:

1894.37	196°.45	183".27	2n	Eng
1908.08	191.40	172.29	3n	β

From these positions the proper motion of A is:

1".393 in 248°.9

This motion is larger by the meridian observations:

Groombridge	1".450	in	249°.2
Porter	1.447	in	249.8
Kustner	1.459	in	249.4

The smaller star is DM (50°) 1724. Comparing this with (50°) 1723, a star 9.3 m, seems to show that the former has no sensible motion, and that the motion of the large star, as given by the measures is correct, if there is no unusual error in the micrometer measures.

1724 and 1723

1908.12	254°.0	303".65	1n	β
1877.3	254.0	303.4		A. G. Harv.

Oxford (Z 26°) 28107 (7.2)

R. A. $10^h\ 11^m\ 19^s.16$ Decl. + 26° 21′ 59″.6

This is the 7.5 m star, DM (26°) 2065, with the photographic place for 1900. The Oxford proper motion is:

0″.305 in 154°.1

There is no available comparison star for the micrometer.

A and DM (26°) 2662

1910.93 Δ R. A. — $62^s.70$ Δ Decl. — 127″.11

A comparison of this with the A. G. positions of 1875 indicates a proper motion in A of 0″.243 in 151°.7.

Groombridge 1636 (6.5...8.8)

R. A. $10^h\ 11^m\ 33^s$ Decl. + 44° 39′

1908.025	103°.75	151″.07
.057	103.75	150.84
.118	103.93	150.84

The micrometer positions are:

1893.30	105°.00	152″.36	2n	Eng
1908.07	103.81	150.92	3n	β

B is DM (44°) 1975. The measures give for the proper motion of the large star:

0″.234 in 190°.2

This is considerably smaller than the transit values, but if the measures are combined with the positions in A. G. Bonn for 1881, the proper motion would be still less.

The prior values are:

Stumpe	0″.314	in	173°.8
Groombridge	0.304	in	165.0
Porter	0.295	in	174.6
Paris	0.328	in	166.5
Boss	0.310	in	169.1

DM (20°) 2465 and 2464 (9.0...9.4)

R. A. $10^h\ 13^m\ 6^s$ Decl. + 20° 28′

1907.845	332°.88	99″.07
8.022	333.03	99.18
8.025	333.05	99.04
1907.96	332.99	99.10

The measures in this case, covering more than half a century, should give a very accurate value of the relative motion.

1856.77	321°.32	111″.52	2n	OΣ
1869.82	323.80	108.01	2n	OΣ
1879.78	326.25	105.53	2n	OΣ
1893.23	329.39	101.50	2n	Eng
1907.96	332.99	99.10	3n	β

These positions give for the proper motion of A:

0″.488 in 267°.5

This is near γ *Leonis*. The proper motion from meridian observations is:

Stumpe	0″.534	in	270°.3
Porter	0.495	in	269.1

Lalande 20155 (8.5...8.7)

R. A. $10^h\ 17^m\ 32^s$ Decl. + 3° 14′

A and B

1907.997	25°.18	100″.73
8.000	24.70	101.01
8.022	24.63	101.32
1908.01	24.84	101.02

A and C (10.3)

1907.997	145°.45	167″.77
8.000	145.25	167.13
8.022	145.35	167.70
1908.01	145.35	167.53

B is DM (3°) 2357. The motion of A is determined from the following transit and micrometer positions:

1842.3	24°.2	82″.12		Lamont
1880.5	25.9	92.60		A. G. Alb.
1891.22	24.99	96.47	3n	Eng
1908.01	24.84	101.02	3n	β

Therefore the apparent motion of L 20155 is:

0″.289 in 207°.9

Some of the meridian values are:

Stumpe	0″.278	in	208°.6
Porter	0.290	in	211.1
Boss	0.283	in	212.0

There are no other measures of the third star.

Oxford (Z 26°) 28528 (9.4)

R. A. $10^h\ 22^m\ 46^s.27$ Decl. + 25° 24′ 3″.1

This is the 8.8 m star, DM (25°) 2255. The place from an astrographic plate taken 1908.25 is for 1900. From a comparison with a prior photograph, the proper motion is given:

0″.136 in 280°.6

A and B (9.0...11.5)

1911.142	226°.60	207″.40
.164	226.50	206.72
.184	226.65	207.23
1911.16	226.58	207.12

DM (32°) 2066 (6.5...10.5)

R. A. $10^h\ 35^m\ 28^s$ Decl. + 32° 19′

1909.109	173°.60	117″.19
.170	173.48	116.97
.186	173.55	117.08
.933	173.26	116.60
.936	173.42	116.26
1909.47	173.46	116.82

The only other measure of this is the following:

1879.60	172°.98	119″.11	2n	Bl

If the measures are correct, the principal star should have a proper motion of

0″.078 in 144°

The only value from meridian positions is:

Boss 0″.030 in 180°

Groombridge 1697 (6.0...9.0)

R. A. $10^h 45^m 16^s$ Decl. + 70° 30′

A and B

1908.022	52°.00	174″.70
.025	52.12	175.15
.044	52.00	175.27
.102	52.00	175.14
1908.05	52.03	175.06

B and *b* (12.8)

1908.022	223°.17	59″.39
.102	222.90	59.83
1908.06	223.03	59.61

No other measures of the faint star. We have the following of AB for comparison:

1842	46°.6	152″.2		O. Arg. N.
1894.53	51.15	170.09	2n	Eng
1908.05	52.03	175.06	4n	β

The direct measures give for the proper motion of A:

0″.418 in 259°.0

Or with the meridian position:

0″.416 in 263°.5

The first is probably the best, notwithstanding the longer interval in the other.

This, from meridian observations only, has been given:

Stumpe	0″.455	in	255°.2
Porter	0.428	in	259.4
Kustner	0.423	in	260.3
Groombridge	0.399	in	258.6
Boss	0.403	in	259.8

DM (1°) 2495 (6.9...12.7)

R. A. $10^h 46^m 4^s$ Decl. + 1° 43′

1912.255	271°.08	39″.53
.274	271.40	39.27
.312	271.13	38.89
1912.28	271.20	39.23

In the first instance this was taken for 55 *Leonis.* I do not find any proper motion assigned to the large star from meridian positions.

Groombridge 1745 and 1744 (7.2...8.5)

R. A. $11^h 5^m 9^s$ Decl. + 43° 29′

A and B

1908.025	247°.18	135″.21
.057	247.08	135.32
.118	247.30	134.96
1908.07	247.19	135.16

B and *b* (12.5)

1908.159	336°.38	132″.64
.266	335.92	132.29
1908.21	336.15	132.46

That the large stars have the same proper motion will be apparent from the following positions:

1810	246°.4	134″.2		Groombridge
1893.36	247.27	134.95	2n	Eng
1895.29	247.2	135.06		Donner
1908.07	247.19	135.16	3n	β

I have therefore measured a third star. The proper motions are given:

A = 0″.285	in	209°.2	Groombridge
0.279	in	214.2	Porter
B = 0.276	in	212.4	Groombridge
0.284	in	212.4	Porter

Oxford (Z 26°) 30038 (10.9)

R. A. $11^h 11^m 13^s.41$ Decl. + 27° 0′ 23″.6

The place for 1900 is from a plate taken 1908.25, which, compared with an earlier exposure, gives a proper motion of:

0″.120 in 311°.8

There is no near star for direct comparison with the micrometer.

A and DM (27°) 2000 (8.3)

1911.14	Δ R. A. — 73s.7	Δ Decl. — 42″.0	β
1900	73.6	41.6	Ox.—A. G.

Anon (9.7...9.7)

R. A. $11^h 22^m 18^s$ Decl. + 8° 19′

The large proper motion of this faint star was detected by Dr. Max Wolf (A. N. 4101) by the change shown on photographic plates made in 1892 and 1906. My early measures have been previously given (Mon. Not. LXVIII, 521) and compared with rough places obtained by measuring photographic paper prints.

The micrometrical measures are:

A and B

1906.906	252°.1	81″.63
7.006	252.0	81.68
7.102	252.1	81.42
7.120	252.2	81.44
1908.118	253.23	80.92
.156	253.10	81.11
.159	253.08	80.68
.192	253.00	80.82
1909.071	253.87	80.13
.112	253.63	80.50
.148	253.80	80.24
.164	253.94	80.15
1910.091	254.78	80.05
.093	254.35	79.87
.107	254.51	79.84
1910.931	255.28	79.02
11.107	255.21	79.08
11.164	255.50	79.09

The several mean results are as follows:

1892.23	242°.1	91″.47		Wolf
1907.03	252.10	81.54	4n	β
1908.15	253.10	80.88	4n	β
1909.12	253.81	80.25	4n	β
1910.10	254.55	79.92	3n	β
1911.07	255.33	79.06	3n	β

The proper motion of A from all these measures is:

1″.228 in 190°.4

Further measures will reduce the error in this value.

To make it certain that B has no proper motion, I have connected it with a 12 m star:

B and C

1906.906	275°.9	155″.17
7.102	275.5	154.48
7.120	275.7	154.17
1908.118	275.90	154.90
.159	275.85	154.70
.192	275.67	154.50

It is obvious that B has no sensible proper motion:

1892.23	275°.9	154″.94		Wolf
1907.04	275.7	154.61	3n	β
1908.15	275.8	154.70	3n	β

61 *Ursae Maj* (6.3...11.2)

R. A. 11ʰ 34ᵐ 44ˢ Decl. + 34° 53′

1907.271	100°.55	159″.39
.331	100.58	159.17
1907.30	100.56	159.28

We have the following measures:

1850.30	108°.12	163″.33	1n	OΣ
1855.25	107.60	162.85	1n	OΣ
1884.29	103.57	160.91	3n	HΣ
1907.30	100.56	159.28	2n	β

The correction to the proper motion is small:

Measures	0″.384	in	184°.0
Auwers	0.380	in	182.8
Boss	0.391	in	181.3

62 *Ursae Maj* (6.0...9.2)

R. A. 11ʰ 35ᵐ 20ˢ Decl. + 32° 25′

1907.197	299°.65	84″.29
.217	299.54	84.50
.258	299.53	84.33
1907.22	299.57	84.37

The small star is DM (32°) 2178. The measures are as follows:

1850.30	297°.20	105″.76	1n	OΣ
1852.27	297.17	105.07	1n	OΣ
1855.25	297.45	103.99	1n	OΣ
1884.27	298.52	93.38	2n	HΣ
1888.33	298.90	91.59	2n	Eng
1907.22	299.57	84.37	3n	β

Therefore the corrected proper motion of the large star is:

Measures	0″.381	in	287°.5
Auwers	0.359	in	274.3
Porter	0.365	in	273.6
Boss	0.347	in	271.8

β *Virginis* (4.0...10.8)

R. A. 11ʰ 44ᵐ 25ˢ Decl. + 2° 26′

1908.156	284°.75	245″.60
.192	284.17	245.28
.214	284.33	245.80
1908.19	284.42	245.56

The following are the direct measures:

1850.31	283°.40	200″.67	1n	OΣ
1855.25	283.45	205.19	1n	OΣ
1884.30	283.85	229.14	2n	HΣ
1908.19	284.42	245.56	3n	β

The proper motion of β *Virginis* from these positions is:

0″.792 in 108°.8

From meridian observations this is given:

Auwers	0.765	in	109.9
Newcomb	0.789	in	110.4
Boss	0.792	in	110.6

OΣ also compared β with a 9 m star *nf.* The distance is too great for the micrometer, and I have therefore measured only the differences in declination.

1908.20 Δ Decl. = 51″.76 2n

Comparing this with the four measures of OΣ (1852-1884) gives substantially the same value for the proper motion in declination as that from the other star.

From AB	Decl. — 0″.252
From AC	0.256

Lalande 22662 and 22667

R. A. 11ʰ 57ᵐ 49ˢ Decl. + 4° 2′

A and B (8.8...9.0)

1907.997	94°.70	111″.21
8.000	94.42	111.11
8.022	94.50	111.30
1908.00	94.54	111.21

Both stars are found in several star catalogues, and each has some proper motion. Unfortunately there is no other star near enough to either to be measured with the micrometer.

The proper motions are:

Lalande 22662

Porter	0″.145	in	295°.2
Kustner	0.125	in	284.8
Paris	0.150	in	270.0

Lalande 22667

Porter	0″.508	in	172°.4
Kustner	0.544	in	174.2
Paris	0.539	in	173.1

The only direct measures are:

1891.27	89°37	108″67	2n	Eng
1908.00	94.54	111.21	3n	β

From these positions the apparent motion of B is:

0″611 in 167°6

10 Virginis (6.2...13.5)

R. A. $12^h\ 3^m\ 32^s$ Decl. + 2° 34′

1909.342	101°88	39″01
10.244	100.80	39.76
10.337	100.57	39.66
1909.97	101.08	39.48

No other measures of the small star. The proper motion of the other is given:

Auwers	0″187	in	176°3
Porter	0.174	in	172.6
A. G. Alb.	0.182	in	174.8

Lalande 22954 (6.0...12.8)

R. A. $12^h\ 9^m\ 0^s$ Decl. — 9° 37′

1909.340	148°85	89″30
.342	149.05	89.44
.378	149.15	89.56
1909.35	149.02	89.43

No other measures. The proper motion of the large star from meridian positions is:

Porter	0″980	in	177°2
Paris	1.007	in	180.0

δ ***Ursae Maj*** (3.5...10.2)

R. A. $12^h\ 9^m\ 30^s$ Decl. + 57° 42′

A and B

1907.197	73°30	190″06
.217	73.30	190.06
.258	73.30	190.30
1907.22	73.30	190.14

A and C (11.7)

1907.217	124°60	186″55
.258	124.80	186.19
1907.23	124.70	186.37

For AB we have the following measures:

1878.20	73°18	192″37	3n	Ball
1886.46	73.33	192.02	2n	Eng
1894.50	73.17	191.49	2n	Eng
1907.22	73.30	190.14	3n	β

These positions give for the most probable proper motion of δ *Ursae:*

0″080 in 68°6

The only prior measure of the third and fainter star is:

1879.30	124°1	188″59	1n	β

This gives nearly the same proper motion as the other star, but as it depends on a single night, the other result is to be preferred.

From meridian observations the proper motion is:

Auwers	0″103	in	86°1
Newcomb	0.121	in	87.5
Boss	0.110	in	88.4

16 *Virginis* (5.0...11.5)

R. A. $12^h\ 14^m\ 15^s$ Decl. + 3° 59′

1909.266	2°78	130″34
.302	2.69	130.39
.304	2.49	130.23
1909.29	2.65	130.32

No other measures. The proper motion is given:

A. G. Alb.	0″322	in	258°4
Porter	0.315	in	257.2
Auwers	0.325	in	258.8
Boss (G. C.)	0.307	in	252.3

SD (12°) 3614 (5.0...13.1)

R. A. $12^h\ 14^m\ 44^s$ Decl. — 12° 54′

1909.304	312°77	48″47
.342	312.92	48.86
.378	313.21	48.43
1909.34	312.97	48.59

From meridian observations this star has no sensible proper motion:

Boss 0″002 in 323°8

7 *Can. Ven.* (6.5...10.7)

R. A. $12^h\ 24^m\ 22^s$ Decl. + 52° 12′

A and B

1908.249	172°05	108″79
.266	171.83	109.23
.370	172.23	109.51
1908.29	172.04	109.18

A and C (8.7)

1908.230	326°00	232″21
.249	326.65	231.58
.266	326.22	231.55
1908.25	326.29	231.78

There are no other direct measures of these stars. C is DM (52°) 1630 (= Groombridge 1896). Taking the relative positions as given from meridian observations in Groombridge, O. Arg. N., A. G. Harvard, and Greenwich 10-year catalogues, with the present measures, we have for the proper motion of the large star:

0″304 in 273°8

Some of the prior determinations are:

Auwers	0″.230	in	271°.5
A. G. Harv.	0.253	in	282.5
Porter	0.288	in	273.6
Boss	0.275	in	273.1

If C has any proper motion at all, it is small and uncertain.

A. G. Harv.	0″.037	in	325°.7
Greenwich	0.033	in	70.6

χ ***Virginis*** (5.0...9.0)

R. A. $12^h\ 32^m\ 3^s$ Decl. — 7° 28′

A and B

1907.258	137°.78	172″.45
.271	137.48	172.85
.331	137.40	172.89
1907.29	137.55	172.73

A and C (10.3)

1907.258	110°.08	221″.49
.271	110.58	220.84
.331	110.57	221.77
1907.29	110.41	221.37

The prior measures are:

AB	1886.39	137°.70	172″.86	2n	Eng
	1894.26	137.77	173.03	2n	Eng
	1907.29	137.55	172.73	3n	β
AC	1886.39	110.72	221.20	2n	Eng
	1894.27	110.92	220.90	2n	Eng
	1907.29	110.41	221.37	3n	β

It is evident from these positions that there is no certain relative motion in twenty years. It is remarkable that two small stars, so far removed, should have exactly the same proper motion, which seems to be the case if the measures are correct. The motion of A, given by the meridian observations, is too large not to appear in measures given above.

Auwers	0″.105	in	258°.4
Newcomb	0.089	in	249.9
Boss	0.084	in	244.0

The measures of the comparison stars should be continued, and other stars connected with both if possible.

Engelhardt measures a third star (Lalande 23627) from A, but the distance is too large for the lowest micrometer eyepiece.

AD	1886.39	330°.10	321″.08	2n	Eng

A comparison of this with Lalande indicates a much smaller proper motion for χ *Virginis.*

33 ***Virginis*** (5.8...8.8)

R. A. $12^h\ 40^m\ 16^s$ Decl. + 10° 13′

1907.271	190°.65	171″.78
.331	190.60	171.93
.348	191.47	171.89
1907.32	190.91	171.87

B is DM (10°) 2467. The measures are:

1852.62	183°.25	192″.59	3n	OΣ
1884.33	187.28	180.14	3n	HΣ
1887.31	187.52	178.94	2n	Eng
1907.32	190.91	171.87	3n	β

It is possible, though not very probable, that a star of the magnitude of B has some proper motion. It is more likely to appear hereafter that the motion of A from transit positions is too small.

Measures	0″.576	in	138°.0
Auwers	0.518	in	149.0
Porter	0.511	in	149.2
Boss	0.531	in	149.2

Piazzi XII. 179 (6.8...9.5)

R. A. $12^h\ 40^m\ 39^s$ Decl. + 24° 48′

1908.079	12°.45	159″.10
.102	12.55	158.83
.118	12.48	159.19
.192	12.50	158.80
1908.12	12.49	158.98

For comparison we have:

1894.28	12°.67	156″.01	2n	Eng
1908.12	12.49	158.98	4n	β

These measures give for the proper motion of A:

Measures	0″.234	in	212°.9
Stumpe	0.256	in	207.1
Porter	0.238	in	210.6

34 ***Virginis*** (6.2...9.4)

R. A. $12^h\ 41^m\ 11^s$ Decl. + 12° 37′

1909.340	4°.20	138″.63
.342	3.95	138.80
.359	4.57	138.76
1909.35	4.24	138.73

No other measures of the small star. The proper motion of 34 *Virginis* is given from meridian observations:

Auwers	0″.042	in	116°.6
Boss	0.054	in	119.0

Piazzi XII. 188 (7.0...10.0)

R. A. $12^h\ 42^m\ 49^s$ Decl. + 12° 45′

A and B

1908.102	356°.53	156″.45
.118	356.55	156.58
.156	356.92	157.31
1908.12	356.67	156.78

B and C (9.4)

1908.102	328°.53	135″.76
.118	328.20	135.55
.156	328.62	135.85
1908.12	328.45	135.72

The measures of AB are:

1893.25	357°.58	155″.23	2n	Eng
1908.12	356.67	156.78	3n	β

The proper motion of A from these positions is:

0″.198 in 118°.9

This is less than that given by transit positions:

Stumpe	0″.285	in	115°.5
Porter	0.265	in	118.6

For BC we have:

1893.25	328°.47	136″.68	1n	Eng
1908.12	328.45	135.72	3n	β

As the first position depends upon a single night, it would not be safe to assume any change in the distance. If that were real, it would make the proper motion of A still smaller.

Lalande 23917 (8.2...9.2)

R. A. $12^h 43^m 38^s$ Decl. + 1° 52′

1908.118	321°.75	141″.10
.156	321.89	140.83
.192	321.68	140.89
1908.16	321.77	140.94

For the relative motion we have:

1893.36	318°.45	134″.43	2n	Eng
1908.16	321.77	140.94	3n	β

Therefore the proper motion of A is:

0″.695 in 190°.9

The meridian observations give:

Boss	0″.700	in	183°.7
Porter	0.676	in	185.2
Paris	0.688	in	180.0

The small star is DM (2°) 2584.

δ ***Virginis*** (3.6...10.5)

R. A. $12^h 49^m 34^s$ Decl. + 4° 3′

1907.997	138°.35	159″.62
8.022	138.43	159.62
8.039	138.23	159.40
1908.02	138.34	159.55

The only other measures are:

1879.30	142°.35	152″.03	2n	β^3
1901.29	139.60	158.07	3n	β

The proper motion of the large star is therefore:

Measures	0″.453	in	267°.0
Auwers	0.493	in	264.2
Newcomb	0.480	in	262.8
Boss	0.479	in	262.3

δ *Virginis* is given in the *General Catalogue of Double Stars* as No. 6308.

ε ***Virginis*** (3.0...11.9)

R. A. $12^h 56^m 13^s$ Decl. + 11° 36′

1909.071	119°.57	248″.64
.112	119.80	249.19
.148	119.83	248.35

For the proper motion of the large star we have:

1879.30	120°.45	240″.89	2n	β^3
1909.11	119.73	248.73	3n	β

The annual movement of ε *Virginis* is therefore:

Measures 0″.283 in 279°.2

This has been given from meridian observations:

Newcomb	0″.274	in	273°.1
Auwers	0.294	in	276.2
Boss	0.273	in	273.6

Oxford (Z 26°) 33127 (10.1)

R. A. $13^h 2^m 45^s.31$ Decl. + 27° 0′ 58″.2

This place for 1900 is from a plate taken 1908.25. Comparing this with a prior exposure gives the small star a considerable proper motion:

0″.141 in 210°.8

It is closely *sf* a 7.5 m star:

DM (27°) 2217 and A (10.5)

1911.107	144°.25	186″.26
.142	143.83	186.07
.164	144.30	185.37
1911.14	144.13	185.90

43 *Comae* (5.0...10.8)

R. A. $13^h 6^m 16^s$ Decl. + 28° 29′

1907.271	250°.65	91″.02
.329	250.53	90.74
.331	250.53	90.73
1907.31	250.57	90.83

The measures cover a period of more than half a century, and should give the proper motion with the highest degree of accuracy.

1851.34	278°.98	131″.10	3n	OΣ
1855.32	277.60	127.48	1n	OΣ
1884.35	264.80	104.95	3n	HΣ
1907.31	250.57	90.83	3n	β

The proper motion of the large star is:

Measures	1″.196	in	319°.3
Auwers	1.201	in	317.8
Boss	1.184	in	317.7

Oxford (Z 26°) 33210 (7.8)

R. A. $13^h 14^m 6^s.37$ Decl. + 25° 8′ 9″.6

The place for 1900 is from the Oxford astrographic plates. From a comparison of the photographic positions the proper motion is given:

0″.292 in 298°.9

This star is DM (25°) 2619 (8.0). A comparison of the Oxford and A. G. Camb. places confirms the motion, giving approximately 0″.19 in 290°.

The only available star for comparison is extremely faint.

A and B (8.0...15.5)

1911.219	175°.70	144″.79

α *Virginis* (1.0...12.2)

R. A. $13^{h}\ 18^{m}\ 54^{s}$ Decl. — 10° 32′

1909.071	32°.80	147″.84
.148	32.40	147.50
.164	32.47	148.23
1909.13	32.42	147.86

The only earlier position is from a single night, and therefore any deduced proper motion at this time would be of uncertain value. Future measures will remedy this.

1879.25	32°.9	144″.42	1n	β^{s}

The proper motion of α *Virginis* from meridian observations is:

Auwers	0″.067	in	251°.7
Newcomb	0.053	in	232.3
Boss	0.055	in	228.9

70 *Virginis* (5.2...8.8)

R. A. $13^{h}\ 22^{m}\ 34^{s}$ Decl. + 14° 25′

1909.170	137°.80	287″.95
.186	137.80	287.44
.206	137.49	287.44
1909.19	137.70	287.61

On account of the great distance for the micrometer, all the measures are subject to more than the usual error, but as the time interval is more than half a century, the proper motion should be substantially correct. The comparison star is DM (14°) 2622.

1852.27	144°.03	304″.54	1n	OΣ
1884.32	140.53	294.73	2n	HΣ
1909.19	137.70	287.61	3n	β

From these positions the proper motion of 70 *Virginis* is:

0″.647 in 203°.4

This has been given from meridian positions:

Auwers	0″.624	in	204°.7
Paris	0.626	in	205.0
Porter	0.623	in	204.5
Boss	0.634	in	202.5

Piazzi XIII. 163 (6.7...10.0)

R. A. $13^{h}\ 35^{m}\ 7^{s}$ Decl. + 28° 40′

1907.997	227°.28	91″.12
8.000	227.42	91.33
8.039	227.45	91.41
1908.01	227.38	91.29

I do not find any proper motion from meridian positions. This is near the cluster, Messier 3. The only other measure is:

1879.25	228°.15	91″.58	2n	β^{s}

The two positions imply a proper motion in A of 0″.042 in 305°.6.

DM (18°) 2776 (9.2...10.6)

R. A. $13^{h}\ 39^{m}\ 14^{s}$ Decl. + 18° 27′

A and B

1911.260	181°.37	88″.78
.334	181.70	88.83
.337	181.25	88.35
1911.31	181.44	88.65

This small star has an extraordinary proper motion:

A. G. Berlin 1″.889 in 168°.3

No other direct measures. From measures by Slocum of a plate made with the 40-inch refractor we have:

1910.10	181°.19	90″.69

A and DM (18°) 2777 (9.0)

1875	Δ Decl. 395″.0	A. G. Ber.
1907.45	331.25	Photo
1910.10	321.65	Photo
1911.33	319.94	β

Oxford (Z 26°) 34103 (10.3)

R. A. $13^{h}\ 39^{m}\ 44^{s}.01$ Decl. + 26° 5′ 36″.1

This place for 1900 is from an Oxford plate made 1908.34. It is identical with the 9.5 m star, DM (26°) 2489. From a comparison with an earlier plate of the *Astrographic Catalogue*, the proper motion is deduced:

0″.186 in 285°.6

A and B (9.5...13)

1911.164	162°.57	87″.00
.184	162.67	88.03
.219	162.38	87.23
1911.19	162.54	87.42

The comparison star is much too faint to appear on the photographic plate

Oxford (Z 26°) 34238 (9.3)

R. A. $13^{h}\ 52^{m}\ 25^{s}.50$ Decl. + 25° 24′ 37″.0

The place (1900) is from an Oxford astrographic plate made 1908.34, and the proper motion from this and an earlier plate is given:

0″.164 in 167°.6

This star is identical with the 9.1 m star, DM (25°) 2706.

A and B (9.3...12.9)

1911.142	27°.40	113″.93
.219	27.58	113.76
1911.18	27.49	113.84

Oxford (Z 26°) 34278 (10.9)

R. A. $13^h\ 54^m\ 49^s.12$ Decl. + 25° 43′ 40″.2

The place for 1900 is from an Oxford astrographic plate taken 1908.34; and this compared with a prior photograph of the same region indicates a remarkable proper motion for a star of this magnitude:

0″.425 in 256°.4

A and B (10.7)

1910.280	58°.65	161″.18
.282	58.27	160.80
.299	58.82	160.81
1910.29	58.58	160.93

A and DM (25°) 2715 (9.3)

1910.260	93°.52	258″.94
.280	93.72	258.48
1910.27	93.62	258.71

A comparison of the Oxford and A. G. positions indicates considerable proper motion in one or both stars.

Prof. H. C. Plummer gives the positions of the two comparison stars from the last plate:

1908.34	58°.5	160″.41
1908.34	93.7	256.89

Oxford (Z 26°) 34290 (10.0)

R. A. $13^h\ 55^m\ 19^s.95$ Decl. + 25° 48′ 44″.9

This star is DM (26°) 2513 (9.5). The place give here is for 1900 from an Oxford plate taken 1908.34. Compared with a prior plate, the proper motion appears to be:

0″.149 in 122°.5

There is no good comparison star for the micrometer.

A and DM (26°) 2517 (8.9)

1910.28	Δ R. A. + $76^s.2$	Δ Decl. + 109″.5	β
1875	76.1	105.3	A. G. Camb.

Lalande 26147 (7.0...11.5)

R. A. $14^h\ 11^m\ 39^s$ Decl. — 6° 59′

1907.258	8°.78	43″.46
8.192	7.80	44.07
8.403	8.45	44.36
1907.95	8.34	43.96

Observed at first by mistake for Ho 384. No other measures. I do not find that any proper motion has been assigned to the principal star.

18 *Bootis* (5.6...10.5)

R. A. $14^h\ 13^m\ 27^s$ Decl. + 13° 34′

1907.271	217°.25	155″.82
.312	217.08	155.87
.329	217.15	155.56
1907.30	217.16	155.75

The complete measures are:

1887.48	216°.67	154″.43	2n	Eng
1894.44	217.03	154.92	2n	Eng
1907.30	217.16	155.75	3n	β

From a mean of the first two, and the last, the proper motion of the large star is:

Measures	0″.084	in	75°.7
Auwers	0.114	in	95.0
Boss	0.114	in	109.4

θ Bootis (4.4...11.0)

R. A. $14^h\ 21^m\ 7^s$ Decl. + 52° 24′

1907.140	182°.6	69″.07
.197	182.0	69.14
.214	182.1	69.04
1907.18	182.2	69.08
1910.337	181.5	69″.34
.340	181.5	69.11
.356	181.8	69.26
1910.34	181.6	69.24

The only other measures are given in the *Pulkowa Observations* Vol. X as follows:

1854.64	181°.9	99″.08	1n	OΣ
1877.00	181.9	98.61	2n	OΣ
1883.47	182.2	99.16	2n	HΣ

Evidently there is no relative motion; and apparently each of the distances is 30″ too large. It is not a printer's error, as the distance of 99″ is twice referred to in the introduction to Vol. X. The proper motion of the system is:

Auwers	0″.468	in	211°.6
Newcomb	0.468	in	210.2
Boss	0.471	in	210.4

There is no third star within reach of the micrometer.

SD (7°)3856 (9.0...9.6)

R. A. $14^h\ 24^m\ 35^s$ Decl. — 8° 6′

1907.137	151°.5	50″.13
.197	151.3	49.95
1907.16	151.4	50.04

The larger star is said to have some proper motion (A. N. 4125). No other measures.

σ Bootis (4.7...10.0)

R. A. $14^h\ 29^m\ 27^s$ Decl. + 30° 16′

A and B

1907.197	82°.5	237″.18
.233	82.4	237.06
1907.21	82.45	237.12

A and C (11.5)

1907.197	97°.2	237″.12
.233	97.2	236.85
1907.21	97.2	236.98

B and C

1907.197	180°.8	59″.80
.214	180.2	60.31
.233	180.5	60.37
1907.21	180.5	60.16

We have the following measures of AB:

1852.40	81°.53	248″.00	2n	OΣ
1870.46	81.82	244.71	1n	OΣ
1881.30	81.92	244.00	1n	OΣ
1907.21	82.45	237.12	2n	β

These positions give for the apparent movement of A:

0″.208 in 62°.3

The measures of BC are:

1853.42	181°.15	57″.65	1n	OΣ
1870.46	180.38	58.53	1n	OΣ
1881.30	181.17	59.15	1n	OΣ
1907.21	180.50	60.16	3n	β

One of these stars has a small proper motion:

0″.052 in 348°.6 (± 180°)

Assuming that this is in B, and applying the correction to the observed movement of A, we have for the real proper motion of that star:

Measures	0″.228	in	49°.7
Auwers	0.225	in	53.8
Newcomb	0.231	in	57.5
Boss	0.227	in	58.2

β **Ursae Min** (2.3...11.5)

R. A. 14h 51m 6s Decl. + 74° 39′

1908.060	342°.25	209″.10
.159	342.25	209.14
.266	341.98	209.19
1908.16	342.16	209.14

The only other measure is:

1879.30	342°.8	207″.82	1n	β^a

As the first position depends upon a single night, the resulting motion cannot be considered as very certain. A continuation of the measures after a proper interval of time will give a reliable result. From the two positions we have:

0″.092 in 282°.2

The values from meridian observations are discordant and doubtful.

Auwers	0″.034	in	266°.6
Groombridge	0.018	in	279.3
Newcomb	0.004	in	317.1
Boss	0.030	in	279.6

22 Librae (6.5...13.1)

R. A. 15h 0m 7s Decl. — 16° 1′

1909.378	275°.5	10″.99
.381	275.1	11.27
.458	274.5	11.07
1909.41	275.0	11.11

This star has a faint companion not heretofore seen. There is another 13 m star, 234°.4 : 35″.7.

The proper motion of 22 *Librae* is:

Auwers	0″.113	in	264°.0
Boss	0.069	in	249.7

45 Bootis (5.2...11.0)

R. A. 15h 2m 2s Decl. + 25° 20′

A and B

1907.329	53°.15	107″.28
.331	52.65	107.15
.351	53.18	107.19
1907.34	52.99	107.21

A and C (9.5)

1907.329	44°.33	246″.51
.331	44.32	246.39
.351	44.32	246.60
1907.34	44.32	246.50

B and C

1907.351	37°.28	141″.68

C is DM (25°) 2874, and is known to have a large proper motion, given by Porter:

0″.933 in 301°.0

The measures of AB are:

1888.53	55°.32	108″.19	4n	Eng
1907.34	52.99	107.21	3n	β

From these measures the proper motion of 45 *Bootis* is:

Measures	0″.239	in	131°.5
Auwers	0.248	in	140.5
Newcomb	0.261	in	135.1
Boss	0.262	in	134.3

The measured positions of AC are:

1887.49	49°.77	252″.29	1n	Eng
1889.56	49.27	251.46	3n	Eng
1907.34	44.27	246.50	3n	β

Rejecting the single observation, the apparent motion of C is:

1″.255 in 303°.9

Correcting this for the proper motion of A as shown by the measures of AB, we have for the real proper motion of C:

1″.018 in 302°.1

SD (15°) 4042 (9.0...9.3)

R. A. 15^h 3^m 38^s Decl. — 15° 50′

A and SD (15°) 4040

1907.258	354°80	114″15
.425	355.00	114.42
.444	355.00	114.88
1910.414	356.57	125.35
.436	357.27	125.09
.452	356.78	125.32
.455	357.00	125.33

A and *a* (11.3)

1907.258	178°15	40″42
.425	178.83	40.02
.444	178.37	39.66
1910.414	172.33	29.42
.452	171.58	29.76
.455	171.11	29.75

No other measures of the small star. The mean results are:

1907.37	178°45	40″01	3n	β
1910.44	171.67	29.64	3n	β

a and SD (15°) 4041

1907.258	181°35	260″27	single dist.

The following are the measures of AB:

1892.40	338°20	66″22	13n	Lv
1894.44	341.02	72.40	2n	Eng
1907.37	354.93	114.48	3n	β
1910.44	356.90	125.36	4n	β

From these positions the proper motion of A is:

3″669 in 195°9

This is given from meridian observations:

Porter	3″665	in	195.0
Bauschinger	3.707	in	195.4

SD (15°) 4041 has exactly the same proper motion. Comparing the above with O. Arg. S. and Cin^{13} shows no sensible relative motion. This is given from meridian observations:

Porter	3″719	in	195″5
Bauschinger	3.730	in	195.2

o *Coronae* (5.7...9.6)

R. A. 15^h 15^m 11^s Decl. + 30° 3′

1909.071	337°45	146″55
.112	337.60	146.74
.148	337.33	146.82
1909.11	337.46	146.70

The earlier measures of this star are:

1887.50	336°73	147″67	2n	Eng
1894.56	336.77	147.89	2n	Eng

A mean of these positions compared with the present relation indicates a smaller proper motion for the principal star than that previously given, the movement in declination being reversed.

Measures	0″118	in	275°6
Auwers	0.147	in	250.5
Boss	0.138	in	245.1

ι *Draconis* (3.5...9.2)

R. A. 15^h 22^m 16^s Decl. + 59° 23′

1909.112	49°90	254″76
.148	49.77	254.67
.164	49.75	254.52
1909.14	49.81	254.65

The smaller star is DM (59°) 1655. The only other measure is:

1879.26	50°0	254″67	1n	β^s

It is obvious that the large star has no proper motion which can be separated from the errors of the observer in any form of measurement. This is shown by the contradictory results found from meridian observations for the proper motion of ι *Draconis:*

Newcomb	0″014	in	48°2
Auwers	0.015	in	336.4
Groombridge	0.015	in	2.9
Gr. 10-year	0.027	in	325.2
Boss	0.016	in	333.0

Both stars are given in A. G. Hels. from which we have:

1875 50°0 254″6

43 *Librae* (5.0...10.5)

R. A. 15^h 35^m 2^s Decl. — 19° 17′

1909.378	279°60	171″37
.381	279.55	170.91
.458	279.45	171.44
1909.40	279.53	171.24

The small star is SD (19°) 4187 (9.3). The other measures are:

1886.38	278°75	172″51	2n	Eng
1894.49	278.42	172.40	1n	Eng

Rejecting the single observation, we have for the proper motion of 43 *Librae:*

0″116 in 217°6

From meridian observations this motion has been given:

Auwers	0″117	in	214°0
Newcomb	0.117	in	205.1
Boss	0.127	in	200.8

ψ *Serpentis* (6.2...9.1)

R. A. 15^h 38^m 0^s Decl. + 2° 56′

A and B

1908.156	207°98	208″08
.192	207.65	208.29
.249	208.13	207.64
1908.20	207.92	208.00

B and C (7.4)

1908.156	235°55	171″92
.192	235.30	171.78
.249	235.45	171.63
1908.20	235.43	171.78

A and *a* (10.8)

1908.266	280°.38	171″.53
.288	280.57	172.07
.291	280.68	171.42
1908.28	280.54	171.67

The only earlier direct measures of A*a* are:

1887.43	279°.73	172″.06	2n	Eng
1894.49	280.03	172.27	2n	Eng
1908.28	280.54	171.67	3n	β

A mean of the first two compared with the last gives the proper motion of the large star:

0″.116 in 204°.4

This smaller value has some support in the measures of the large stars as compared with the places in *A. G. Albany*, although B and C may have some motion of their own. The faint star may be treated as fixed. The errors of the micrometer places, and especially the shortness of the interval, doubtless have some effect, but this will be done away with by later measures.

The meridian values of the proper motion of the large star are:

Stumpe	0″.171	in	213°.6
Porter	0.175	in	215.7
Boss	0.173	in	209.7

κ **Coronae** (5.0...11.7)

R. A. 15ʰ 46ᵐ 43ˢ Decl. + 36° 2′

1909.304	202°.20	139″.73
.340	202.48	139.40
.342	202.35	139.93
1909.33	202.34	139.69

There are no other measures of the small star.

The proper motion of κ *Coronae* is given:

Auwers	0″.359	in	186°.4
Porter	0.360	in	185.8
Boss	0.364	in	182.1

39 **Serpentis** (6.0...12.0)

R. A. 15ʰ 47ᵐ 37ˢ Decl. + 13° 34′

1907.197	115°.6	98″.08
.214	115.7	98.55
.217	115.9	98.16
1907.21	115.73	98.26

For finding the proper motion of the principal star we have:

1862.38	130°.52	106″.45	1n	OΣ
1883.60	124.02	101.77	1n	HΣ
1907.21	115.73	98.26	3n	β

The proper motion is therefore:

Measures	0″.616	in	196°.0
Auwers	0.562	in	198.8
Porter	0.580	in	198.0
Boss	0.586	in	196.0

γ **Serpentis** (4.0...10.6)

R. A. 15ʰ 50ᵐ 55ˢ Decl. + 16° 3′

A and B

1908.041	315°.02	201″.01
.156	315.05	201.92
.192	315.30	201.65
1908.13	315.12	201.53

B and C (11.0)

1908.041	165°.38	177″.05
.156	165.42	177.14
.192	165.23	177.18
1908.13	165.34	177.12

No other measures of C. For AB we have:

1850.41	299°.08	139″.25	1n	OΣ
1854.38	300.88	143.44	1n	OΣ
1883.47	309.37	173.55	2n	HΣ
1908.13	315.12	201.53	3n	β

From which we have the corrected proper motion of γ *Serpentis:*

Measures	1″.341	in	164°.5
Auwers	1.313	in	167.5
Newcomb	1.324	in	166.9
Boss	1.332	in	166.9

49 **Librae** (5.4...11.0)

R. A. 15ʰ 53ᵐ 36ˢ Decl. — 16° 11′

1907.444	306°.35	155″.29
7.463	306.15	155.58
8.192	306.63	154.52
8.249	306.65	154.92
1907.84	306.44	155.08

We have the following measures:

1886.38	301°.28	162″.70	2n	Eng
1894.49	302.72	159.54	1n	Eng
1907.84	306.44	155.08	4n	β

Rejecting the single measure for obvious error, we have for the proper motion of 49 *Librae:*

0″.754 in 241°.9

The meridian values are nearly the same:

Auwers	0″.775	in	241°.7
Porter	0.750	in	239.6
Newcomb	0.737	in	238.2
Boss	0.749	in	237.7

δ **Ophiuchi** (2.6...13.0)

R. A. 16ʰ 8ᵐ 6ˢ Decl. — 3° 23′

1908.192	294°.03	65″.54
.249	294.83	65.26
.252	294.50	65.68
1908.23	294.45	65.49

The only other measure is:

1879.38	291°.6	64″.65	1n	β^3

As the comparison star is very faint, and the first position from a single night, no great weight can be given to this proper motion:

Measures	0″.120	in	188°.1
Auwers	0.155	in	205.7
Newcomb	0.152	in	198.2
Boss	0.161	in	197.9

18 *Scorpii* (5.6...13.3)

R. A. $16^h\ 9^m\ 6^s$ Decl. — 8° 3′

1910.225	216°.4	23″.40
.260	215.9	23.64
.395	216.8	23.61
1910.29	216.4	23.55

No other observations of the small star. The proper motion of 18 *Scorpii* is given:

Auwers	0″.540	in	162°.1
Boss	0.564	in	156.2

15 *Herculis* (7.5...9.8)

R. A. $16^h\ 10^m\ 35^s$ Decl. + 11° 43′

A and B

1907.197	257°.70	64″.89
.217	258.00	64.92
.258	257.90	64.97
1907.22	257.87	64.93

B and C (11.0)

1907.258	17°.80	108″.05
.293	17.80	107.80
1907.28	17.80	107.92

No other measures of C. For AB we have:

1887.53	259°.23	66″.16	2n	Eng
1894.54	259.37	65.79	2n	Eng
1907.22	257.87	64.93	3n	β

From which the proper motion is:

Measures	0″.104	in	310°.6
Auwers	0.113	in	294.1
Boss	0.058	in	300.0

Lalande 29917 (8.6...10.6)

R. A. $16^h\ 16^m\ 30^s$ Decl. + 67° 32′

1908.118	13°.58	63″.42
.156	13.50	63.52
.192	13.18	63.39
1908.16	13.42	63.44

It will be seen from the measures, that whatever the proper motion of the larger star is, it is sensibly the same for the other.

1893.67	13°.35	64″.00	2n	Eng
1908.16	13.42	63.44	3n	β

The proper motion of A is given in the star catalogues:

Stumpe	0″.482	in	283°.4
Porter	0.498	in	281.9
Schroeter	0.519	in	279.7

There is no third star near enough for the micrometer.

ξ *Coronae* (5.0...12.4)

R. A. $16^h\ 17^m\ 25^s$ Decl. + 31° 10′

1909.340	59°.52	185″.19
.342	59.45	185.05
.378	59.45	185.03
1909.35	59.47	185.09

No other measures of the small star. The proper motion of ξ *Coronae* is given:

Auwers	0″.138	in	326°.3
Boss	0.132	in	314.1
Newcomb	0.121	in	326.6

Lalande 29836 (8.3...11.3)

R. A. $16^h\ 17^m\ 36^s$ Decl. — 13° 21′

1909.381	281°.20	103″.43
.458	280.78	102.82
.496	281.03	102.65
1909.44	281.00	102.97

No other measures. The proper motion of the large star is given:

Porter	0″.333	in	224°.6
Paris	0.314	in	220.8

Anonymous (10.7...13.3)

R. A. $16^h\ 20^m\ 35^s$ Decl. + 48° 38′

A and B

1911.260	283°.40	70″.41
.337	283.38	70.64
.375	283.78	70.94
1911.32	283.52	70.66

This small star is given a large proper motion by Kapteyn:

1″.231 in 111°.2

No other micrometer position in verification of this motion. The nearest A. G. star is *sf:*

A and DM (48°) 2399 (8.9)

1911.29 Δ R. A. + 113^s.16 Δ Decl. — 106″.85

β *Herculis* (3.0...10.3)

R. A. $16^h\ 25^m\ 4^s$ Decl. + 21° 45′

1909.112	274°.60	255″.65
.148	274.40	255.29
.164	274.50	255.01
1909.14	274.50	255.32

The first measures are too discordant in distance to be used for proper motion:

1879.30	274°.3	256″.15	1n	β
1879.34	274.3	257.74	1n	β

Comparing the last, which seems to be entitled to the largest weight, with the recent position, we have for the proper motion of β *Herculis:*

Measures	0″.086	in	254°.0
Auwers	0.110	in	266.4
Newcomb	0.109	in	256.9
Boss	0.107	in	257.1

12 *Ophiuchi* (6.0...13.7)

R. A. $16^h\,30^m\,3^s$ Decl. —2° 4′

1909.381	244°.80	100″.34
10.414	245.67	100.42
10.436	245.20	100.04
1910.08	245.22	100.27

No other measures. The proper motion of 12 *Ophiuchi* is given in the catalogues:

Auwers	0″.490	in	129°.1
Porter	0.527	in	128.0
Paris	0.539	in	128.3
Boss	0.546	in	125.6

SD (2°) 4230 (7.0...12.5)

R. A. $16^h\,34^m\,52^s$ Decl. — 2° 37′

1909.378	62°.18	91″.50
.381	61.45	91.84
.400	61.64	91.36
1909.39	61.76	91.57

No other measures. The proper motion of the principal star is given from meridian observations:

Porter	0″.432	in	188°.6
Paris	0.481	in	180.0

Bradley 2134 (7.5...9.0)

R. A. $16^h\,40^m\,51^s$ Decl. + 2° 28′

A and B

1909.227	219°.04	150″.10
.304	219.38	150.33
.378	219.52	150.02
1909.30	219.31	150.15

These stars are DM (2°) 3174 and 3173. We have the following from meridian and micrometer positions:

1880.8	220°.0	148″.1		A. G. Alb.
1887.51	219.67	150.48	2n	Eng
1894.51	219.62	150.35	2n	Eng
1894.5	219.1	149.8		Porter

The proper motion from meridian positions appears to be too large unless the smaller star has some motion of its own. For determining this hereafter, I have connected a very faint star with C.

B and C (12.5)

1909.227	173°.18	76″.07
.304	172.80	75.96
.378	172.83	75.51
1909.30	172.94	75.85

A comparison of a mean of the two positions by Engelhardt with the present measures of AB gives for the proper motion of the principal star:

0″.050 in 292°.6

The proper motion of the principal star is given from the star catalogues:

Auwers	0″.167	in	291°.0
A. G. Alb.	0.128	in	290.1
Porter	0.081	in	280.7

45 *Herculis* (5.3...10.5)

R. A. $16^h\,41^m\,52^s$ Decl. + 5° 28′

1911.395	83°.98	122″.67
.411	83.87	122.59
.414	83.90	122.85
1911.41	83.92	122.70

No other measures. The proper motion is apparently small.

Auwers	0″.075	in	234°.3
Boss	0.051	in	208.0

DM (4°) 3265 (8.3...8.3)

R. A. $16^h\,44^m\,7^s$ Decl. + 4° 56′

1911.395	353°.80	52″.44
.411	353.66	52.53
.414	353.20	52.36
1911.41	353.55	52.44

B is DM (4°) 3264 (9.0). No other measures. From meridian positions:

1879	352°.9	52″.3	A. G. Alb.

30 *Ophiuchi* (5.0...9.8)

R. A. $16^h\,54^m\,44^s$ Decl. — 4° 2′

1907.258	69°.65	92″.74
.331	69.03	92.63
.351	68.92	92.69
1907.31	69.20	92.69

The prior measures are:

1887.51	69°.80	91″.82	2n	Eng
1894.48	69.63	92.52	2n	Eng
1907.31	69.20	92.69	3n	β

These measures are not consistent, and therefore any derived proper motion, must be considered as more or less uncertain. A mean of the first two, compared with the last, gives for the large star:

Measures	0″.060	in	191°.3
Auwers	0.104	in	227.1
Newcomb	0.080	in	199.3
Boss	0.103	in	211.5

34 *Ophiuchi* (6.2...10.3)

R. A. $16^h\ 58^m\ 27^s$ Decl. + 13° 44′

A and B

1909.148	267°.50	151″.52
.151	267.63	151.75
.167	267.77	151.59
1909.15	267.63	151.62

B and C (10.5)

1909.167	209°.57	98″.64
.227	209.28	98.38
.304	209.27	98.50
1909.23	209.37	98.51

No other measures of C. Of the other we have:

1887.52	266°.55	151″.44	2n	Eng
1894.69	267.03	152.11	2n	Eng

From these positions the proper motion of the large star is:

0″.124 in 178°.7

The first values from meridian observations differ in direction, and show a reverse motion in R. A.

Auwers	0″.134	in	185°.6
Porter	0.134	in	199.4
Boss	0.135	in	173.8

The principal star is the following and smaller member of the wide pair, Σ 33, App. I.

DM (42°) 2810 (9.4...9.2)

R. A. $17^h\ 9^m\ 22^s$ Decl. + 42° 29′

A and B

1912.236	279°.32	209″.96
.255	279.42	209.33
.274	279.07	209.13
.296	279.23	209.07
1912.26	279.26	209.37

From a comparison of photographic plates, this small star is given an unusually large proper motion (*Bul. Acad. Sci.*, St. Petersburg, Feb. 1912):

1″.111 in 250°.5

No careful meridian position of both stars found. The approximate DM places give:

1855 275° 255″

B is DM (42°) 2808. Measures after a short interval will show whether this large motion is real.

Lalande 31478 (7.8...9.8)

R. A. $17^h\ 13^m\ 30^s$ Decl. — 7° 53′

1908.252	222°.80	102″.73
.266	223.23	102.88
.288	223.25	103.01
.331	222.87	103.05
1908.28	223.04	102.92

The only earlier measure is:

1893.61	222°.60	105″.48	2n	Eng
1908.28	223.04	102.92	4n	β

These positions give for the proper motion of A:

Measures	0″.183	in	205°.4
Porter	0.203	in	183.8
Paris	0.196	in	180.0

DM (52°) 2058 (8.0...11.1)

R. A. $17^h\ 24^m\ 21^s$ Decl. + 51° 59′

1910.148	105°.55	123″.22
.164	105.87	123.56
.184	105.84	123.65
1910.16	105.75	123.48

The only other measures show no change.

1879.98	105°.93	123″.00	2n	Bl

DM (18°) 3424 (9.0...10.3)

R. A. $17^h\ 33^m\ 32^s$ Decl. + 18° 38′

1912.274	264°.50	267″.77
.351	264.73	267.94
1912.31	264.61	267.85

This star is supposed to have a large proper motion:

A. G. Berlin 1″.255 in 314°.5

For comparison the nearest available star is measured. The nearest DM star is the following:

A and DM (18°) 3423 (9.0)

1875	Δ R. A. — 25s.7	Δ Decl. — 22″.2	A. G. Ber.
1912.27	— 24.9	— 4.0	β

These positions imply a proper motion principally in declination.

DM (68°) 946 (9.1...7.9)

R. A. $17^h\ 37^m\ 8^s$ Decl. + 68° 27′

1907.293	62°.37	67″.91
.312	61.78	67.30
.329	62.23	67.73
1907.31	62.13	67.64

In this instance the proper motion is in the smaller star. B is DM (68°) 947. For comparison we have:

1877.7	99°.7	49″.64		A. G. Chris.
1892.76	77.68	55.93	2n	Eng
1907.31	62.13	67.64	3n	β

The micrometer measures give for the proper motion of A:

1″.397 in 194°.7

Or combined with A. G.:

1″.399 in 195°.2

From meridian observations:

A. G.	1″.270	in	197°.1
Porter	1.296	in	196.8
Schroeter	1.350	in	196.7

The catalogues find no proper motion in B.

83 *Herculis* (5.8...9.4)

R. A. $17^h\ 37^m\ 33^s$ Decl. + 24° 38′

1909.340	259°.82	157″.67
.342	259.78	157.37
.378	260.08	157.57
1909.35	259.90	157.54

The prior measures of this star are as follows:

1886.63	259°.45	159″.75	2n	Eng
1894.69	259.57	159.63	2n	Eng

From these measures we have for the proper motion of 83 *Herculis:*

0″.129 in 233°.0

From meridian positions:

Auwers	0″.134	in	218°.1
Porter	0.124	in	219.0
Boss	0.131	in	208.6

DM (20°) 3646 (8.5...9.0)

R. A. $17^h\ 57^m\ 3^s$ Decl. + 20° 58′

A and DM (20°) 3647

1912.353	154°.43	145″.06
.389	154.63	145.75
.408	154.50	145.89
1912.38	154.52	145.57

A and star 9.0 m

1912.353	284°.23	144″.94
.389	284.05	145.05
.408	284.00	145.23
1912.38	284.09	145.07

In consequence of an error in plotting these stars on the DM maps, it was supposed that there had been considerable change in the relative position, but this is not confirmed. From meridian observations we have for AB:

1865	154°.7	146″.4	Bruxelles
1875	154.3	144.9	A. G. Ber.

Piazzi XVII. 368 (7.7...10.0)

R. A. $18^h\ 1^m\ 7^s$ Decl. + 8° 52′

1908.192	240°.13	130″.98
.249	240.13	130.68
.252	240.03	131.24
.331	240.13	131.47
1908.26	240.10	131.09

These are all the measures:

1893.66	239°.60	132″.19	3n	Eng
1908.26	240.10	131.09	4n	β

The former proper motion appears to be too large:

Measures	0″.109	in	193°.5
Stumpe	0.165	in	167.5
Porter	0.157	in	170.2

To make it certain hereafter that B has no motion, I have connected with it a 13 m star:

B and C

1908.444	37°.43	80″.37
.460	37.80	80.46
.479	37.53	80.53
1908.46	37.59	80.45

T *Herculis* (Var...10.3)

R. A. $18^h\ 4^m\ 34^s$ Decl. + 31° 0′

1909.167	321°.07	67″.08
.186	320.88	66.80
.227	321.18	67.08
1909.19	321.04	66.99

The principal star is variable. The early measures differ in distance; probably unchanged.

1877.79	321°.90	66″.93	1n	Bl
1879.24	320.78	68.28	1n	Bl

DM (23°) 3289 (7.5...10.8)

R. A. $18^h\ 11^m\ 31^s$ Decl. + 23° 21′

A and B

1908.403	3°.38	128″.91
.422	3.20	129.08
.425	3.68	129.30
1908.42	3.42	129.10

B and C (11.5)

1908.403	246°.0	18″.00
.422	246.3	17.82
.425	246.3	17.82
1908.42	246.2	17.88

The only other measures are:

1877.72	3°.77	130″.62	1n	Bl
1879.27	3.49	129.19	1n	Bl

DM (23°) 3299 (7.0...9.3)

R. A. 18^h 13^m 8^s Decl. + 23° 15′

A and B

1908.403	125°.85	155″.89
.422	125.63	155.99
.425	125.85	156.20
1908.42	125.78	156.03

A and *a* (11.8)

1908.422	222°.58	37″.60
.425	222.50	38.02
1908.42	222.54	37.81

The only earlier measure is:

1878.50	125°.91	156″.61	2n	Bl

109 *Herculis* (4.1...10.6)

R. A. 18^h 18^m 35^s Decl. + 21° 43′

1909.186	320°.55	222″.00
.304	320.50	221.50
.340	320.63	221.84
1909.28	320.56	221.78

We have the following earlier measures of the small star:

1854.70	320°.70	204″.80	1n	OΣ
1868.55	320.95	208.81	1n	OΣ
1883.54	320.52	213.79	2n	HΣ

The several positions give for the corrected proper motion of 109 *Herculis:*

0″.314 in 137°.6

Some of the prior values are:

Auwers	0″.310	in	144°.8
Newcomb	0.325	in	143.6
Boss	0.326	in	143.6

χ *Draconis* (3.8...12.0)

R. A. 18^h 23^m 12^s Decl. + 72° 41′

A and B

1908.252	18°.55	149″.19
.266	18.60	148.94
.370	19.02	149.34
.383	18.88	149.41
1908.32	18.76	149.22

B and C (13.5)

1908.383	300°.4	10″.30
.422	301.2	10.05
.425	302.8	10.20
1908.41	301.5	10.18

For comparison we have:

1879.33	26°.50	144″.61	2n	β^3
1908.32	18.76	149.22	4n	β

These positions give for the proper motion of χ *Draconis:*

0″.704 in 126°.6

From meridian observations:

Auwers	0″.642	in	126°.6
Groombridge	0.653	in	125.6
Newcomb	0.643	in	126.1
Boss	0.638	in	125.4

There are no other measures of BC.

Oxford (Z 26°) 50932 (12.4)

R. A. 18^h 30^m 26^s.91 Decl. + 26° 10′ 31″.1

Place for 1900 from a plate of the Oxford *Astrographic Catalogue* taken 1907.54. The proper motion is given:

0″.170 in 198°.5

A and B (11.9...12.4)

1910.414	48°.70	60″.52
.436	48.70	60.14
1910.42	48.70	60.33

A and C (12.4)

1910.414	37°.23	81″.92
.436	37.13	81.88
1910.42	37.18	81.90

Oxford 50932 and 50936

1910.41	Δ R. A. + 42^s.24	Δ Decl. + 7″.75	β
1907.54	42.35	7.8	Oxf

As these two stars are supposed to be moving in nearly opposite directions, the difference in declination should increase about 0″.3 per year.

Oxford (Z 26°) 50936 (10.1)

R. A. 18^h 31^m 9^s.26 Decl. + 26° 10′ 38″.9

This is DM (26°) 3302 (9.3). The place given is for 1900, from an astrographic plate taken 1907.54. The Oxford proper motion, deduced from this and an earlier plate, is:

0″.124 in 36°.0

A and B (9.3...9.8)

1910.414	341°.65	95″.42
.436	341.62	95.73
1910.42	341.63	95.57

A and DM (26°) 3297 (9.1)

1910.414	245°.40	291″.16
.436	245.17	290.95
1910.42	245.28	291.05

The place of A, derived from the A. G. position of the comparison star, does not indicate any sensible proper motion.

DM (6°) 3855 (5.0...13.3)

R. A. 18^h 30^m 49^s Decl. + 6° 35′

A and B

1910.586	321°.6	26″.46
.589	322.3	26.93
.605	323.6	26.55
1910.59	322.5	26.65

A and C (11.0)

1910.586	89°.22	72".39
.589	88.89	72.22
.605	89.36	72.52
1910.59	89.16	72.38

The faint companion noted by Jonckheere. The large star has some proper motion:

Boss 0".146 in 196°.6

DM (11°) 3534 (8.8...10.8)

R. A. $18^h\ 31^m\ 45^s$ Decl. + 11° 21′

1910.299	264°.88	132".13
.337	264.78	132.01
.395	264.62	132.19
1910.34	264.76	132.11

The prior measures are too discordant in distance for any inference with respect to change.

1876.78	265°.15	134".94	1n	Bl
1879.55	264.90	132.53	2n	Bl

Oxford (Z 26°) 50702 (11.5)

R. A. $18^h\ 34^m\ 4^s.36$ Decl. + 25° 38′ 13".6

Place (1900) from the Oxford *Astrographic Catalogue;* plate taken 1907.54. From a comparison of the photographic positions the proper motion is given:

0".165 in 192°.8

A and B (11.1...10.9)

1910.471	163°.10	119".08
.473	163.28	118.51
.490	163.08	118.85
1910.48	163.15	118.81

B and C (11.1)

1910.471	205°.70	64".92
.473	205.58	65.39
.490	205.62	65.14
1910.48	205.63	65.15

The comparison stars should appear on both plates.

A and DM (25°) 3581 (8.4)

1910.47 Δ R. A. — 130".46 Δ Decl. + 50".20

3 *Aquilae* (5.0...13.1)

R. A. $18^h\ 36^m\ 59^s$ Decl. — 8° 24′

A and C

1910.605	195°.46	37".16
.608	194.03	37.84
.644	195.17	37.77
1910.62	194.89	37.59

Noted by Jonckheere. There is a nearer and fainter star 14.5 m:

1910.608 97°.3 13".58

The proper motion of 3 *Aquilae,* if any, is very uncertain:

Auwers	0".018	in	340°.8
Boss	0.022	in	62.6

DM (39°) 3505 (6.5...9.5)

R. A. $18^h\ 39^m\ 17^s$ Decl. + 39° 11′

1910.184	191°.40	60".34
.206	191.77	60.48
.225	191.49	60.15
1910.20	191.55	60.32

A sometimes called red; only reddish or yellow. C is DM (39°) 3504. No evidence of proper motion in the measures.

1877.93	191°.47	60".10	2n	Bl

111 *Herculis* (4.5...10.5)

R. A. $18^h\ 41^m\ 43^s$ Decl. + 18° 3′

A and B

1907.293	245°.82	98".50
.312	245.55	98.33
.331	245.72	98.67
1907.31	245.70	98.50

A and C (10.0)

1907.293	257°.05	120".63
.312	256.38	120.56
.331	256.82	120.60
1907.31	256.75	120.60

A and D (10.5)

1907.293	264°.08	133".14
.312	263.45	132.60
.331	263.47	133.01
1907.31	263.67	132.92

B and C

1907.312	294°.5	30".06
.329	294.5	29.85
.331	294.7	29.84
1907.32	294.6	29.92

C and D

1907.312	312°.3	19".74
.329	312.1	19.67
.331	312.0	19.98
1907.32	312.1	19.80

The only other measures are:

AB	1886.76	247°.21	96".21	2n	Eng
AC	1886.76	257.73	118.34	2n	Eng
	1894.71	257.52	119.98	2n	Eng
AD	1886.76	264.83	131.19	2n	Eng
	1894.78	264.45	132.14	2n	Eng

Comparing these with the recent positions we have the proper motion of the large star from the several companions:

AB	R. A. +0″.052	Decl. +0″.159
AC	.060	.127
AD	.066	.097
	+0.057	+0.128

Hence the mean proper motion is:

0″.140 in 24°.0

There is no evidence of any relative change in this group of small stars. For a verification of this hereafter, I have connected them directly.

The proper motion of 111 *Herculis* from observations on the meridian is given:

Auwers	0″.127	in	21°.7
Newcomb	0.116	in	28.6
Boss	0.123	in	30.6
Porter	0.130	in	23.2

ε ***Aquilae*** (4.3...10.2)

R. A. 18ʰ 54ᵐ 11ˢ Decl. + 14° 54′

A and B

1909.304	186°.70	131″.65
.340	186.65	130.80
.400	186.85	131.09
1909.35	186.73	131.18

A and C (10.3)

1909.304	163°.13	148″.25
.340	162.82	148.10
.400	163.38	147.83
1909.35	163.11	148.06

B and C

1909.400	100°.71	59″.89
.455	100.80	59.32
.458	100.58	59.44
1909.44	100.70	59.55

These stars have been measured as follows:

AB	1887.59	187°.25	132″.43	2n	Eng
	1894.71	187.35	132.75	2n	Eng
AC	1887.58	163.67	148.57	1n	Eng

From the positions of AB the proper motion of ε *Aquilae* is:

0″.105 in 229°.9

The measures of AC give substantially the same value, but as the early position depends on a single observation, it can add nothing to the other, and for the present should be rejected.

The movement of the large star has been given from meridian positions:

Auwers	0″.103	in	229°.4
Newcomb	0.101	in	216.8
Boss	0.100	in	219.6

DM (33°) 3295 (7.1...12.6)

R. A. 18ʰ 57ᵐ 22ˢ Decl. + 33° 47′

1911.162	177°.8	25″.71
.184	178.8	25.44
.200	178.8	25.64
1911.18	178.5	25.60

Faint companion noted by Jonckheere; no other measures. No proper motion found in the star catalogues.

R *Aquilae* (Var...11.1)

R. A. 19ʰ 0ᵐ 36ˢ Decl. + 8° 3′

A and B

1910.397	296°.13	74″.35
.452	296.12	74.42
.455	296.48	74.57
1910.43	296.24	74.45

A and C (10.8)

1910.397	258°.85	180″.41
.452	258.83	180.16
.455	259.08	180.13
1910.43	258.92	180.23

Change doubtful.

1878.55	294°.73	73″.51	2n	Bl

The more distant star is DM (8°) 3968 (9.5). The prior measures are uncertain in distance:

1877.75	258°.78	178″.93	1n	Bl
1879.33	258.52	180.60	1n	Bl

Lalande 35851 (5.5...9.5)

R. A. 19ʰ 2ᵐ 34ˢ Decl. + 16° 40′

1908.192	275°.08	119″.62
.252	274.88	119.96
.288	275.05	120.31
.331	274.97	119.52
1908.26	275.00	119.93

B is DM (16°) 3751. The measures are:

1893.67	273°.22	119″.57	2n	Eng
1908.26	275.00	119.93	4n	β

The several values of the proper motion are:

Measures	0″.257	in	178°.6
A. G. Berlin	0.297	in	171.4
Porter	0.314	in	165.7
Paris	0.337	in	162.1

DM (18°) 4011 (6.3...10.9)

R. A. 19ʰ 10ᵐ 14ˢ Decl. + 18° 18′

1909.496	165°.38	136″.96
.512	165.41	136.60
.515	165.30	136.97
1909.51	165.36	136.84

The principal star, according to A. G. Berlin, has a considerable proper motion:

0″.132 in 283°.2

The measures point to a much smaller value, if there is any motion at all.

1879.05 165°.74 136″.02 2n Bl

δ *Draconis* (3.3...12.5)

R. A. $19^h 12^m 30^s$ Decl. + 67° 27′

1907.312	352°.05	88″.28
.463	351.98	87.87
.465	351.97	88.10
1907.41	352.00	88.08

The only previous measure is:

1879.35 354°.3 90″.35 1n β^2

As this is on a single night, and therefore subject to accidental errors, the resulting proper motion cannot take the place of the other values.

Measures	0″.151	in	50°.8
Auwers	0.119	in	49.8
Newcomb	0.134	in	49.4
Boss	0.133	in	49.1

DM (19°) 3975 (6.8...9.3)

R. A. $19^h 13^m 33^s$ Decl. + 19° 23′

1911.302	317°.75	93″.37
.334	318.27	92.99
.356	318.17	92.61
1911.33	318.06	92.99

The principal star said to be variable. The smaller is DM (19°) 3974. The proper motion of A, if any, is very small:

A. G. Berlin 0″.017 in 305°.2

No other measures of the companion.

1875 318°.6 91″.8 A. G. Berlin

Oxford (Z 26°) 55357 (8.4)

R. A. $19^h 13^m 44^s.96$ Decl. + 25° 10′ 57″.9

Place from the Oxford *Astrographic Catalogue* for 1900; plate taken 1907.78. The proper motion from photographic positions is given:

0″.274 in 20°.6

A and DM (25°) 3783 (9.5)

1910.299	38°.55	82″.19
.395	38.40	82.28
.436	38.70	82.47
1910.38	38.55	82.31

A is DM (25°) 3780 (8.0). The comparison star not in A. G. and no accurate place found elsewhere. The rough DM positions give, 54° : 120″.

26 *Aquilae* (5.2...12.0)

R. A. $19^h 14^m 9^s$ Decl. — 5° 38′

1909.666	12°.23	120″.02
.703	12.60	120.00
.706	12.10	120.26
1909.69	12.31	120.09

The small star has not been previously measured. The proper motion of 26 *Aquilae* is:

Auwers	0″.099	in	52°.8
Porter	0.095	in	57.7
Boss	0.110	in	69.3

Groombridge 2835 (6.5...10)

R. A. $19^h 18^m 51^s$ Decl. + 64° 10′

1909.455	181°.38	111″.90
.512	181.21	111.85
.515	181.30	112.03
1909.49	181.30	111.93

No other position of the small star. The proper motion of the large star is practically zero:

Groombridge 0″.015 in 70°.9

31 *Aquilae* (5.3...8.7)

R. A. $19^h 19^m 15^s$ Decl. + 11° 41′

A and B

1907.731	344°.74	106″.56
.750	344.42	106.28
.772	344.54	106.45
1907.75	344.57	106.43

B and C (9.7)

1907.731	254°.00	42″.26
.750	253.72	42.24
.772	253.47	42.50
1907.75	253.73	42.33

The measures in this case are sufficient in number of nights, and in the time interval, to give the proper motion far more accurately than by any other method. For AB we have:

1852.70	4°.05	142″.57	2n	OΣ
1858.08	2.83	138.47	2n	OΣ
1865.80	0.48	133.05	1n	OΣ
1877.58	356.82	124.72	2n	OΣ
1907.75	344.57	106.43	3n	β

B is DM (11°) 3834, and has a small proper motion. The measures of AB give for the apparent motion of the principal star:

0″.986 in 43°.4

The measures of BC are:

1852.70	247°.27	42″.59	2n	OΣ
1858.08	248.08	42.25	2n	OΣ
1865.80	248.82	42.62	1n	OΣ
1877.58	249.85	42.20	2n	OΣ
1907.75	253.73	42.33	3n	β

Hence the proper motion of B is:

0″.085 in 162°.9

Therefore the real proper motion of 31 *Aquilae* is:

0″.947 in 47°.9

This is given from transit observations:

Auwers	0″.967	in	47°.7
Porter	0.974	in	47.9
Newcomb	0.964	in	49.1
Boss	0.961	in	49.0

δ *Aquilae* (3.7...11.2)

R. A. $19^h\,19^m\,27^s$ Decl. + 2° 57′

1907.291	270°.83	109″.39
.293	270.90	108.62
.312	270.30	108.57
1907.30	270.67	108.86

The only prior measure which can be used for comparison is:

1879.35 271°.85 101″.33 2n β³

Hence the proper motion of the large star is:

Measures	0″.280	in	75°.2
Auwers	0.245	in	69.2
Newcomb	0.264	in	72.3
Boss	0.265	in	73.1

DM (1°) 4004 (7.8...10.9)

R. A. $19^h\,21^m\,48^s$ Decl. + 1° 56′

1909.304	253°.10	115″.70
.342	253.72	115.02
.378	253.45	115.23
1909.34	253.42	115.32

No proper motion has been assigned to this star, and the measures show no change.

1879.06 253°.27 115″.17 2n Bl

DM (1°) 4021 (7.1...10.9)

R. A. $19^h\,25^m\,1^s$ Decl. + 1° 46′

1909.304	286°.65	111″.00
.342	286.92	110.74
.378	286.93	110.91
1909.34	286.83	110.88

The first measures give a larger distance.

1879.07 286°.40 113″.07 2n Bl

The apparent change may be due to a small proper motion in A, or to errors of observation. I do not find that any movement has been assigned to the principal star from meridian positions. Another set of measures at some later time will show whether or not the change is real. It is not probable that B has any motion. To determine this hereafter by a single measure, I have connected a third star 11.2 m:

B and C (11.2)

1909.381	215°.20	75″.71
.438	215.03	75.95
1909.41	215.11	75.83

Cygni 176 (6.5...14.5)

R. A. $19^h\,26^m\,26^s$ Decl. + 35° 59′

A and B

1911.184	28°.5	22″.42
.241	30.5	22.46
1911.21	29.5	22.44

A and C (13.7)

1911.184	159°.2	27″.56
.200	160.1	27.69
.241	158.5	27.83
1911.21	159.3	27.69

No other measures. I do not find that any proper motion has been given the large star. The faint companions were detected by Jonckheere.

DM (7°) 4124 (9.0...12.4)

R. A. $19^h\,27^m\,14^s$ Decl. + 7° 9′

A and B

1910.395	249°.1	8″.44
.397	252.3	8.65
.452	254.2	8.52
1910.41	251.9	8.54

A and C (11.1)

1910.395	200°.25	90″.57
.397	200.07	90.34
.452	200.33	90.31
1910.41	200.22	90.41

This small star, which is 70^s preceding μ *Aquilae,* is given a proper motion of 0″.310 in 177°.2 by Battermann. No other measures.

Lalande 37093 (9.0...11.3)

R. A. $19^h\,29^m\,36^s$ Decl. — 0° 30′

1909.570	258°.52	112″.99
.589	257.98	112.81
.592	258.23	113.32
1909.58	258.24	113.04

No other measures of the small star.

The following proper motions are from the meridian positions:

Paris	0″.409	in	184°.2
Porter	0.340	in	193.5

Lalande 37110 (8.0...12.0)

R. A. 19^h 29^m 52^s Decl. — 0° 9′

1909.551	228°.30	109″.07
.570	228.15	109.24
.589	228.45	108.93
1909.57	228.30	109.08

No other measures. The proper motion of the principal star is given from meridian positions:

Paris	0″.423	in	180°.0
Porter	0.370	in	188.2

Lalande 37111 (7.2...11.7)

R. A. 19^h 29^m 52^s Decl. — 0° 1′

1909.551	265°.32	67″.77
.570	265.88	67.72
.589	265.72	67.47
1909.57	265.64	67.65

I do not find any proper motion assigned to this star.

ι *Aquilae* (4.5...13.2)

R. A. 19^h 30^m 31^s Decl. — 1° 33′

1910.570	161°.3	47″.00
.586	161.1	47.10
.589	160.8	46.93
1910.58	161.1	47.01

The principal star appears from the meridian observations to have no sensible proper motion:

Auwers	0″.012	in	244°.5
Boss	0.018	in	194.8

Aquilae 140 (6.0...14.0)

R. A. 19^h 31^m 13^s Decl. + 11° 0′

A and B

1910.570	58°.8	16″.72
.589	55.7	17.78
1910.58	57.2	17.25

A and C (13.2)

1910.570	315°.9	20″.10
.586	314.7	20.10
.589	315.7	20.29
1910.58	315.4	20.16

Small stars detected by Jonckheere. No proper motion found for the large star.

R *Cygni* (Var...9.7)

R. A. 19^h 33^m 36^s Decl. + 49° 56′

1909.266	14°.15	90″.60
.342	13.69	90.93
.381	13.90	90.86
1909.33	13.91	90.80

A is reddish and variable, 7 m to 13 m. At the time of these measures the magnitude was about 10.7. These stars are respectively DM (49°) 3064 and 3065, and closely *sf θ Cygni.*

The micrometer positions are not accordant in distance, but probably without change.

1876.70	14°.22	91″.79	1n	Bl
1879.25	13.45	90.77	1n	Bl
1881	12.7	90.3		A. G. Bonn

The proper motion of R *Cygni* is unknown from the catalogue positions:

Groombridge	0″.018	in	144°.6
Boss	0.014	in	218.3

α Sagittae (4.0...12.8)

R. A. 19^h 34^m 44^s Decl. + 17° 44′

1910.570	179°.8	33″.24
.586	180.4	32.78
.589	179.8	32.86
1910.58	180.0	32.96

Noted by Jonckheere. There is a 14.5 m star, 249° : 35″.8. The proper motion of α *Sagittae* is small and uncertain:

Auwers	0″.012	in	180°.0
Boss	0.036	in	153.8

DM (32°) 3522 (8.0...10.8)

R. A. 19^h 36^m 24^s Decl. + 32° 20′

A and B

1909.342	212°.52	70″.61
.381	212.87	70.02
.400	212.85	70.71
1909.37	212.75	70.45

A and C (11.1)

1909.342	48°.95	82″.69
.381	48.97	82.64
.400	49.05	82.84
1909.37	48.99	82.72

A and D (10.7)

1909.381	268°.63	93″.58
.400	268.80	93.90
1909.39	268.71	93.74

Probably unchanged. The principal star is reddish.

AB	1878.65	212°.57	71″.46	3n	Bl
AC	1878.81	49.38	84.22	1n	Bl
	1879.39	47.93	82.64	1n	Bl
AD	1878.68	268.37	93.71	3n	Bl

Piazzi XIX. 230 (5.6...11.8)

R. A. 19^h 36^m 43^s Decl. — 15° 45′

1910.605	128°.90	81″.84
.608	128.60	81.77
.627	129.12	81.70
1910.61	128.87	81.77

No other measures. The proper motion is given:

Boss	0″.236	in	140°.5
Porter	0.227	in	143.3

Groombridge 2909 (5.5...12.2)

R. A. $19^h\,37^m\,8^s$ Decl. + 45° 14′

1911.509	143°.80	84″.33
.526	144.15	85.02
.529	144.47	85.17
1911.52	144.14	84.84

No other measures. The proper motion is given:

Groombridge	0″.132	in	45°.1
Boss	0.142	in	42.4

Groombridge 2914 and 2915 (8.2...8.2)

R. A. $19^h\,38^m\,19^s$ Decl. + 39° 43′

1909.266	164°.65	102″.44
.340	164.85	101.91
.342	164.82	101.98
1909.31	164.77	102.11

The proper motions of these stars are given in the Groombridge catalogue:

No. 2914	0″.047	in	291°.2
No. 2915	0.044	in	217.2

There are no other direct measures. The following approximate places are from meridian observations:

1813	164°.6	98″.8	Groombridge
1825	163.5	100.5	Weisse
1846	164.5	99.0	Radcliffe
1880	164.3	101.8	A. G. Lund
1891	163.8	101.9	Gr. 10-year

It is evident that there has been very little if any relative change, and that the proper motions are probably identical. One or both of the values given above must be in error. It will be noticed that the motions in declination are in opposite directions, and therefore the distance of the components should increase annually nearly 0″.05.

γ ***Aquilae*** (3.7...11.0)

R. A. $19^h\,40^m\,33^s$ Decl. + 10° 19′

1907.714	257°.43	133″.13
.731	257.83	132.61
.750	257.67	132.45
1907.73	257.64	132.73

For comparison there is only this:

1879.42	257°.70	132″.58	2n	β^s

It is evident that the proper motion of the large star, if any at all, is much less than the unavoidable errors of positions with the micrometer, as well as the meridian circle; and that only from direct measures, separated by long intervals of time, can any relative motion be certainly shown.

The motion from meridian observations is very doubtful:

Auwers	0″.008	in	315°.5
Newcomb	0.011	in	107.2
Boss	0.014	in	106.8

Lalande 37626 (7.2...9.5)

R. A. $19^h\,41^m\,27^s$ Decl. + 0° 48′

A and B

1908.383	120°.98	101″.50
.422	120.83	101.28
.441	120.70	100.92
.444	120.63	101.64
1908.42	120.78	101.33

B and C (11.0)

1908.422	195°.60	30″.72
.441	195.25	30.72
.444	195.53	30.77
1908.43	195.46	30.74

For comparison we have:

1893.65	123°.03	102″.04	2n	Eng
1908.42	120.78	101.33	4n	β

There are no other measures of C. B is DM (0°) 4215. The measures of AB give for the proper motion of the principal star:

0″.275 in 201°.8

This has been given from meridian positions:

Stumpe	0″.291	in	206°.6
Porter	0.228	in	200.8
A. G. Nico.	0.238	in	180.0
Paris	0.233	in	180.0

o ***Aquilae*** (5.3...12.8)

R. A. $19^h\,45^m\,17^s$ Decl. + 10° 7′

1910.570	222°.7	22″.69
.586	221.3	22.93
.589	222.6	23.20
1910.58	222.2	22.94

This companion was noted by Jonckheere. There is also a 13.5 m star, 161°.5 : 20″.5.

The proper motion of o *Aquilae* is given:

Auwers	0″.262	in	124°.6
Boss	0.273	in	122.0
Porter	0.260	in	122.6

χ ***Cygni*** (Var...10.8)

R. A. $19^h\,45^m\,57^s$ Decl. + 32° 37′

1909.342	254°.32	158″.49
.381	254.67	157.89
.400	254.52	157.63
1909.37	254.50	158.00

The principal star, DM (32°) 3593, is variable, 5 m to 13.5 m. The former measures disagree in distance, and therefore change is uncertain.

1880.32	254°.45	160″.18	1n	Bl
1881.78	254.23	159.11	1n	Bl

The variable has a small proper motion:

Boss	0″.093	in	234°.5

Piazzi XIX. 306 (6.5...12.0)

R. A. 19^h 46^m 26^s Decl. + 11° 20′

1909.551	159°.90	93″.48
.570	159.98	94.34
.589	159.76	93.83
1909.57	159.88	93.88

Several faint stars nearer than that measured. No other observations. The proper motion is given:

Paris	0″.470	in	219°.0
Porter	0.481	in	229.9

Groombridge 2961 (8.0...11.1)

R. A. 19^h 48^m 46^s Decl. + 38° 27′

1909.340	313°.58	43″.76
.342	313.75	43.70
.381	313.32	43.62
1909.35	313.55	43.69

No other measures. The proper motion of the principal star is given:

Groombridge	0″.321	in	357°.0
Porter	0.358	in	354.9
Gr. 10-year	0.350	in	360.0

DM (43°) 3425 (8.2...11.2)

R. A. 19^h 53^m 20^s Decl. + 43° 56′

1909.342	16°.03	56″.41
.381	15.97	56.29
.400	16.28	56.03
1909.37	16.09	56.24

The principal star is red; erroneously called (43°) 3422 in Bl. The early positions are discordant in distance; probably unchanged.

1876.80	15°.76	56″.80	1n	Bl
1880.26	16.03	55.86	1n	Bl

15 *Sagittae* (6.0...8.8)

R. A. 19^h 58^m 43^s Decl. + 16° 45′

A and B

1908.326	274°.50	194″.27
.383	274.82	194.08
.403	274.93	194.12
1908.37	274.78	194.16

A and C (7.0)

1908.326	318°.07	203″.25
.383	318.48	203.14
.403	318.48	203.39
1908.37	318.34	203.26

C is Bradley 2567, and B is DM (16°) 4117.

The only direct measures are:

AB	1886.78	272°.41	201″.42	2n	Eng
AC	1886.78	315.04	202.80	2n	Eng

From the two comparison stars the apparent motion of A is:

From AB	0″.508	in	225°.3
From AC	0.542	in	224.4

The proper motion of 15 *Sagittae* has been given from meridian positions:

Auwers	0″.571	in	228°.4
Porter	0.573	in	225.6
Boss	0.577	in	224.4

This would seem to be a little too large, as it is not probable that the small star B has any sensible motion.

The 7 m star would be expected to have some movement, and undoubtedly has, although the amount is small, and uncertain.

A. G. Berlin	0″.015	in	28°.9
Porter	0.037	in	4.4
Auwers	0.012	in	330.1

For an independent determination of the proper motions of the two bright stars, and showing the absence of change in B, if that is the fact, I have connected each with a small star.

A and *a* (11.7)

1908.326	320°.23	58″.48
.383	320.88	58.74
.403	320.53	58.79
1908.37	320.55	58.67

B and *b* (9.2)

1908.422	231°.00	183″.22
.425	231.12	183.08
.444	230.80	183.25
1908.43	230.97	183.18

C and *c* (11.8)

1908.326	183°.60	93″.38
.383	184.05	93.85
.403	183.93	93.59
1908.37	183.86	93.45

DM (20°) 4417 (8.9...13.5)

R. A. 19^h 59^m 48^s Decl. + 20° 18′

A and B

1909.493	246°.9	13″.05
.496	249.5	13.13
1909.49	248.2	13.09

A and C (12.1)

1909.381	103°.80	59″.34
.493	103.87	58.95
.496	103.17	59.28
1909.46	103.61	59.19

A and D (12.2)

1909.381	95°.77	75″.99
.493	95.53	75.69
.496	95.60	75.68
1909.46	95.63	75.79

The principal star is red. The only other measures of AD are too discordant for any inference as to change

1879.31	96°.57	78°.39	1n	Bl
1879.85	95.18	80.12	1n	Bl

27 *Cygni* (5.6...13.8)

R. A. 20ʰ 1ᵐ 54ˢ Decl. + 35° 38′

A and B

1909.515	62°.5	16″.21
.531	64.1	16.28
.534	64.7	16.10
1909.53	63.8	16.20

A and C (11.7)

1909.515	154°.20	40″.17
.531	154.47	40.11
.534	154.83	40.32
1909.53	154.50	40.23

The small stars have not been seen before. Only a short interval will be required to show whether or not they are moving with the large star. The proper motion of that is given:

Auwers	0″.485	in	210°.0
Paris	0.467	in	209.2
Porter	0.477	in	208.7
Boss	0.495	in	207.8

Groombridge 3042 (6.0...9.3)

R. A. 20ʰ 3ᵐ 4ˢ Decl. + 52° 49′

1908.370	124°.95	170″.53
.383	124.79	170.80
.403	124.85	169.73
.406	124.80	170.46
1908.39	124.85	170.38

The small star is DM (52°) 2626. This is given in the catalogues O. Arg. N. and A. G. Harvard. The direct measures are:

1893.98	123°.27	171″.84	3n	Eng
1908.39	124.85	170.38	4n	β

From these positions the proper motion of Groombridge 3042 would be:

Measures	0″.342	in	51°.0
Stumpe	0.304	in	40.3
Porter	0.307	in	39.6
Groombridge	0.334	in	40.0
A. G. Har.	0.347	in	43.3
Boss	0.334	in	41.0

The two positions of A in the first catalogue referred to differ too much to be used in this connection. In the other the large error in declination is obvious. If this is assumed to be 1′, the A. G. position with the measures would give the proper motion:

0″.336 in 42°.8

Piazzi XX. 23 (7.2...9.2)

R. A. 20ʰ 5ᵐ 39ˢ Decl. + 15° 49′

A and B

1908.425	151°.98	152″.43
.444	152.18	151.86
.460	151.77	152.10
.479	152.00	152.73
1908.45	151.98	152.28

B and C (11.6)

1908.425	270°.48	63″.92
.460	270.68	63.63
.479	270.55	63.72
1908.45	270.57	63.76

B is DM (15°) 4075. No other measures of C.

1893.80	152°.73	144″.02	2n	Eng
1908.45	151.98	152.28	4n	β

These positions give for the proper motion of the principal star:

0″.582 in 319°.4

The correction to the former values from meridian observations is small.

Stumpe	0″.587	in	307°.4
A. G. Berlin	0.580	in	313.4
Porter	0.596	in	312.6

ξ ***Capricorni*** (5.8...12.0)

R. A. 20ʰ 5ᵐ 45ˢ Decl. — 12° 58′

1909.666	258°.97	71″.57
.703	258.62	71.48
.706	258.87	71.81
1909.69	258.82	71.62

No other measures. The proper motion is given:

Auwers	0″.239	in	138°.8
Porter	0.259	in	138.6
Newcomb	0.253	in	138.3
Boss	0.269	in	135.9

DM (47°) 3031 (9.4...9.5)

R. A. 20ʰ 5ᵐ 51ˢ Decl. + 47° 31′

1909.342	139°.42	145″.15
.476	139.45	145.11
.493	139.85	145.65
1909.44	139.57	145.39

A is reddish. Apparently without any proper motion.

1879.05	139°.68	145″.05	2n	Bl

DM (35°) 4013 (8.0...10.3)

R. A. $20^{h}\,6^{m}\,27^{s}$ Decl. + 35° 46′

1909.515	109°.80	53″.35
.531	109.90	53.06
1909.52	109.85	53.20

The other measures are discordant in distance:

1878.90	110°.08	53″.94	1n	Bl
1879.40	109.95	52.56	1n	Bl

DM (38°) 3957 (8.2...7.2)

R. A. $20^{h}\,9^{m}\,2^{s}$ Decl. + 38° 22′

A and B

1909.493	354°.80	131″.92
.515	355.07	132.40
.531	355.15	132.13
1909.51	355.01	132.15

A and C (9.3)

1909.493	106°.07	155″.50
.515	106.10	155.73
.531	106.10	155.91
1909.51	106.09	155.71

The primary is a red star; the other is DM (38°) 3956. For these stars we have the following positions:

1879.15	355°.24	132″.65	2n	Bl
1881	354.8	133.0		A. G. Lund.

There is an obvious error in one of the former distances of the small star:

1878.90	106°.02	156″.99	1n	Bl
1879.40	106.52	155.92	1n	Bl

DM (36°) 3956 (8.0...9.8)

R. A. $20^{h}\,10^{m}\,2^{s}$ Decl. + 36° 18′

1909.493	117°.87	113″.12
.496	117.80	113.74
.415	117.73	114.03
1909.47	117.80	113.63

This star is 8′ *s* of 29 *Cygni*. It appears to have no sensible proper motion.

1878.16	117°.69	113″.63	2n	Bl

29 *Cygni* (5.0...7.0)

R. A. $20^{h}\,10^{m}\,2^{s}$ Decl. + 36° 26′

A and B

1908.266	153°.05	212″.50
.383	153.52	212.51
.403	153.25	212.35
1908.35	153.27	212.45

A and C (10.0)

1908.266	22°.73	222″.60
.383	23.08	223.09
.403	23.22	222.82
1908.35	23.01	222.84

A and *a* (12.2)

1908.266	341°.32	38″.70
.383	341.83	38.93
.403	341.18	38.91
1908.35	341.44	38.85

B and D (10.6)

1908.422	120°.20	217″.15
.425	120.25	217.22
1908.42	120.22	217.18

The proper motion of the principal star is given from meridian observations:

Auwers	0″.106	in	11°.8
Porter	0.106	in	33.9
Boss	0.094	in	43.8

B is Bradley 2599 with a small proper motion:

Auwers	0″.044	in	334°.2

For comparison we have the following with the micrometer:

A and B

1887.82	153°.07	212″.04	1n	Eng
1908.35	153.27	212.45	3n	β

A and C

1887.82	23°.40	225″.16	1n	Eng
1894.84	23.22	225.00	1n	Eng
1908.35	23.01	222.84	3n	β

B and D

1894.85	120°.42	216″.54	1n	Eng
1908.42	120.22	217.18	2n	β

The measures of AB show no sensible change. A mean of the first two positions of AC compared with the last gives for the apparent movement of A:

0″.148 in 50°.6

It is not likely that a star of this magnitude has any sensible motion, and the larger value may be due to errors in the measures. The early positions are all derived from single nights, and therefore subject to some question. All these stars should be re-measured after a suitable interval. There are many stars in the field; I have measured one of the nearest to A.

Groombridge 3127 (8.0...9.5)

R. A. $20^{h}\,13^{m}\,28^{s}$ Decl. + 49° 55′

A and B

1908.370	92°.03	57″.24
.383	91.68	57.23
.482	91.77	57.07
.518	92.02	57.12
1908.44	91.88	57.16

A and C (9.7)

1908.370	173°.73	107″.04
.383	173.52	106.89
.482	173.17	107.22
.518	173.25	106.96
1908.44	173.42	107.03

A and D (9.7)

1908.370	333°.15	118″.04
.383	332.95	117.78
.482	333.10	117.84
.518	332.58	118.09
1908.44	332.94	117.94

A and E (9.7)

1908.370	128°.75	155″.83
.383	128.53	155.75
.482	128.97	155.88
.518	128.22	155.41
1908.44	128.62	155.72

B and *b* (12.0)

1908.370	203°.3	10″.20
.383	203.5	10.52
.482	204.3	10.27
.518	205.0	10.22
1908.44	204.0	10.30

D and *d* (11.9)

1908.482	212°.70	86″.88
.518	212.48	86.87
1908.50	212.59	86.87

The only other measures are:

AB	1892.76	96°.10	54″.45	2n	Eng
AC	1892.76	175.82	109.95	2n	Eng
AD	1892.76	331.45	117.71	2n	Eng
AE	1892.76	130.88	155.69	1n	Eng

From these measures the corrected proper motion of the principal star is:

AB	R. A. — 0″.191	Decl. — 0″.249
AC	.271	.213
AD	.259	.103
AE	.253	.301
	— 0.244	— 0.216

From the mean result of all the measures we have:

0″.325 in 228°.6

There seems to be some error in the measures of AD. It is not probable that the small star has any motion. To make this certain hereafter, I have connected a faint star.

The proper motion of Groombridge 3127 has been given from meridian positions:

Greenwich	0″.304	in	227°.3
Paris	0.288	in	226.6
A. G. Bonn	0.335	in	230.9
Porter	0.299	in	228.5

U Cygni (8.7...8.8)

R. A. $20^h\ 15^m\ 53^s$ Decl. + 47° 31′

1909.400	51°.55	63″.51
.438	51.53	63.78
.476	51.38	63.53
1909.44	51.49	63.61

These stars are DM (47°) 3077 and 3078; the first is variable from about 7 m to 10 m. There seems to be no sensible proper motion in either.

1875	52°.0	63″.8		A. G. Bonn
1878.63	51.57	63.55	2n	Bl

DM (36°) 4025 (9.3...9.5)

R. A. $20^h\ 16^m\ 50^s$ Decl. + 36° 33′

1909.400	110°.65	125″.95
.493	110.43	125.58
.496	110.60	125.87
1909.46	110.56	125.80

The smaller star is DM (36°) 4028.

The only prior measures are the following:

1880.58	110°.72	124″.65	2n	Bl

Piazzi XX. 120 (8.6...10.7)

R. A. $20^h\ 17^m\ 29^s$ Decl. + 10° 50′

A and B

1908.422	83°.94	52″.39
.425	84.30	52.23
.441	84.25	52.05
1908.43	84.16	52.22

A and C (10.0)

1908.422	102°.77	150″.30
.425	102.64	150.10
.441	102.65	149.92
1908.43	102.69	150.11

The other measures are:

AB	1891.80	86°.62	50″.19	1n	Eng
AC	1891.80	103.88	149.16	2n	Eng

From these positions the annual movement of the principal star is:

AB	R. A. — 0″.111	Decl. — 0″.141
AC	.081	.170
	— 0.096	— 0.155

The proper motion of the principal star is therefore:

0″.182 in 211°.8

From meridian observations:

Stumpe	0″.204	in	217°.4
Porter	0.186	in	221.7

DM (38°) 4063 (8.9...12.0)

R. A. $20^h\ 19^m\ 24^s$ Decl. + 38° 6′

A and B

1909.400	319°.75	38″.33
.493	319.18	38.60
.515	318.97	38.60
1909.47	319.30	38.51

A and C (9.2)

1909.400	295°.88	66″.55
.493	295.97	66.34
.515	295.83	66.53
1909.47	295.89	66.47

C is DM (38°) 4062. These stars are in the cluster, *h* 2078 (= M 29). The only other measures are:

AB	1879.31	319°.2	38″.62	in	β^2
AC	1879.31	295.1	66.27	in	β^2

Evidently unchanged.

Oxford (Z 26°) 66211 (12.2...13.1)

R. A. $20^h\ 21^m\ 5^s.16$ Decl. + 26° 32′ 25″.3

The place of the larger star, for 1900, is from an Oxford astrographic plate taken 1904.76. From a comparison of this with an earlier photograph, it appears that both stars have a proper motion which is probably the same:

A	0″.142	in	290°.2
B	0.135	in	280.7

A and B (10.8...10.9)

1910.299	232°.55	67″.55
.337	232.63	66.84
.375	232.47	67.72
1910.34	232.55	67.37

B and C (10.8)

1910.337	232°.63	164″.42
.375	232.93	164.03
.397	232.60	164.27
1910.37	232.72	164.24

The reduced Oxford places give for AB, 232°.5 : 68″.0.

A and DM (26°) 3902 (9.0)

1910.30 Δ R. A. + $69^s.6$ Δ Decl. — 74″.23

A and DM (26°) 3895 (9.5)

1910.30 Δ R. A. + $31^s.3$ Δ Decl. + 146″.82

A comparison of the Oxford and A. G. meridian positions of these stars does not indicate any sensible motion in A. Later measures of BC will show what the fact is.

DM (26°) 3897 (8.2...9.6)

R. A. $20^h\ 21^m\ 34^s$ Decl. + 26° 17′

A and B

1910.337	72°.60	75″.74
.375	72.90	75.89
.397	72.63	75.62
1910.37	72.71	75.65

The small star is DM (26°) 3898. No other micrometer measures.

1875	72°.3	76″.5	A. G. Camb.

B has a small companion not previously seen:

B and C (12.5)

1910.337	355°.7	2″.49
.397	357.0	2.15
1910.36	356.3	2.32

Oxford (Z 26°) 66226 (10.6)

R. A. $20^h\ 25^m\ 58^s.20$ Decl. + 26° 30′ 40″.5

Place for 1900, from a plate of the Oxford *Astrographic Catalogue* taken 1904.76. The photographic positions give the proper motion:

0″.180 in 194°.3

This is DM (26°) 3915 (9.5); not in A. G. Camb.

A and B (9.5...13.0)

1910.455	255°.55	22″.57
.471	256.58	22.91
.473	254.05	22.29
1910.47	255.39	22.59

A and C (10.0)

1910.455	271°.88	108″.12
.471	272.20	108.02
.473	271.65	107.87
1910.47	271.91	108.00

A and DM (26°) 3920 (9.4)

1910.5	Δ R. A. + $98^s.4$	Δ Decl. — 97″.5	β
1900	98.4	100.7	Oxf.—A. G.

47 *Cygni* (4.8...10.4)

R. A. $20^h\ 29^m\ 17^s$ Decl. + 34° 50′

1909.438	190°.50	117″.74
.458	190.42	117.74
.512	190.30	117.45
1909.47	190.41	117.64

The meridian observations give 47 *Cygni* no sensible proper motion, and this is confirmed by the measures of the small star:

1880.30	190°.52	117″.63	2n	Bl

From the catalogues we have:

Auwers	0″.018	in	240°.8
Boss	0.014	in	190.0

Oxford (Z 26°) 66463 (10.2)

R. A. $20^h\ 31^m\ 25^s.06$ Decl. + 25° 2′ 12″.1

This is DM (24°) 4182 (9.5). In nearly every case the Oxford photographic magnitudes make the small stars about three-fourths of a magnitude too faint, as compared with the values assigned in visual observations. The place given here is for 1900 from a plate taken 1904.76. The photographic positions give the proper motion:

0″.228 in 237°.7

With the A. G. position the change is smaller and uncertain.

A and B (9.6...11.3)

1910.512	259°.62	192″.00
.529	260.17	192.21
1910.52	259.89	192.10

Bradley 2669 (6.8...10.8)

R. A. 20ʰ 34ᵐ 7ˢ Decl. + 10° 49′

1908.383	8°.35	192″.30
.422	8.10	192.39
.425	8.13	192.31
1908.41	8.19	192.33

For comparison we have:

1886.79	8°.77	194″.64	2n	Eng
1894.13	8.43	194.50	3n	Eng
1908.41	8.19	192.33	3n	β

These positions are not entirely consistent. Comparing the last with a mean of the first two, the proper motion of the large star is:

0″.114 in 352°.2

The meridian observations give:

Auwers	0″.130	in	39°.5
Porter	0.090	in	360.0

Lalande 39956 (6.5...11.6)

R. A. 20ʰ 35ᵐ 20ˢ Decl. +19° 30′

1909.551	24°.72	98″.95
.573	24.73	98.94
.589	24.42	98.51
1909.57	24.62	98.80

No other measures. The proper motion has been found:

Paris	0″.383	in	32°.6
Porter	0.387	in	26.0

75 *Draconis* (5.0...10.5)

R. A. 20ʰ 35ᵐ 43ˢ Decl. + 81° 5′

A and B

1908.383	13°.78	109″.58
.403	13.05	109.56
.422	13.48	109.38
1908.40	13.44	109.51

A and C (6.5)

1908.383	284°.48	197″.93
.403	284.45	197.64
.422	284.20	197.81
1908.40	284.38	197.79

No other measures of B, and only this of AC:

1884.31	285°.27	198″.42	2n	HΣ

The proper motion of 75 *Draconis* is small and uncertain:

Auwers	0″.022	in	105°.8
Boss	0.031	in	65.4

C is Bradley 2701, and according to Auwers has a proper motion of 0″.042 in 90°.

74 *Draconis* (6.0...7.5)

R. A. 20ʰ 36ᵐ 20ˢ Decl. + 80° 40′

A and B

1908.252	38°.20	214″.19
.370	38.43	214.44
.383	38.05	214.68
1908.33	38.23	214.44

B and C (10.7)

1908.252	306°.23	107″.31
.370	306.75	107.26
.383	306.50	107.21
1908.33	306.49	107.26

The relative motion should be accurately known from these measures:

1851.87	40°.12	214″.29	1n	OΣ
1884.32	39.30	214.93	2n	HΣ
1908.33	38.23	214.44	3n	β

These positions give for the apparent movement of the larger star:

0″.124 in 131°.2

The proper motion of 74 *Draconis* is given from meridian observations:

Auwers	0″.217	in	16°.7
Groombridge	0.231	in	26.2
Porter	0.208	in	17.4

Assuming the last value to be correct, the real proper motion of the smaller star is:

0″.281 in 353°.7

For an independent determination of this hereafter, I have connected a third star.

A more recent determination of the proper motion of A is:

Boss 0″.227 in 18°.3

S *Delphini* (Var...8.2)

R. A. 20ʰ 37ᵐ 33ˢ Decl. + 16° 39′

1909.304	341°.20	55″.92
.378	341.46	55.62
.381	341.33	55.90
1909.35	341.33	55.81

These stars are respectively DM (16°) 4351 and 4350. The first is variable from 8.5 m to 12 m. At the time of these measures, the components were sensibly equal. Neither seems to have any proper motion. The measure of 1879 is corrected for an error of 180° in the angle.

1870	342°.1	57″.1		A. G. Ber.
1879.63	341.67	55.88	2n	Bl

Oxford (Z 26°) 68464 (11.1)

R. A. $20^{h}\,38^{m}\,44^{s}.97$ Decl. + 26° 27′ 22″.6

Place for 1900 from plate taken 1904.76 of the Oxford *Astrographic Catalogue.* The photographic positions indicate a proper motion of:

0″.307 in 206°.5

A and B (10.7...11.6)

1910.452	123°.85	61″.73
.455	123.65	61.53
1910.45	123.75	61.63

Oxford (Z 26°) 67901 (6.6)

R. A. $20^{h}\,39^{m}\,1^{s}.67$ Decl. 25° 27′ 53″.3

This is the 7.5 m star, DM ((25°) 4347. The place for 1900 is from the Oxford *Astrographic Catalogue,* plate taken 1904.76. From the photographic positions the proper motion is given:

0″.155 in 358°.0

A and B (7.5...15.0)

1910.452	228°.1	16″.94

A and C (13.0)

1910.436	208°.47	39″.77
.452	208.10	39.70
1910.44	208.28	39.73

A and DM (25°) 4350 (8.9)

1910.44	Δ R. A. + 27^{s}.8	Δ Decl. — 86″.2	β
1875	27.9	88.1	A. G.

A and DM (25°) 4343 (9.1)

1910.44	Δ R. A. — 31^{s}.4	Δ Decl. + 123″.0	β
1875	31.4	124.3	A. G.

***Cephei* 6 (Hev.)** (4.7...9.5)

R. A. $20^{h}\,42^{m}\,22^{s}$ Decl. + 57° 9′

1908.331	162°.40	68″.60
.383	162.90	68.84
.403	162.63	68.20
1908.37	162.64	68.55

The small star is DM (57°) 2241. The only other measure is:

1894.00	164°.87	71″.77	2n	Eng

These positions give for the proper motion of the large star:

0″.225 in 169°.8

Both stars in A. G. With the measures and the meridian positions in 1875, the proper motion becomes:

0″.267 in 167°.5

The motion in R. A. is very small and uncertain. The other values are:

Auwers	0″.251	in	197°.6
Groombridge	0.256	in	198.8
Boss	0.241	in	196.2
Porter	0.268	in	201.3

Oxford (Z 26°) 67632 (11.3)

R. A. $20^{h}\,43^{m}\,30^{s}.02$ Decl. + 24° 56′ 44″.3

From the Oxford *Astrographic Catalogue;* place for 1900 from plate taken 1904.76. The proper motion is given:

0″.155 in 190°.1

A and B (10.7...10.9)

1910.512	38°.68	47″.09
.529	40.13	47.04
1910.52	39.40	47.06

A and C (11.2)

1910.512	100°.25	103″.20
.529	100.93	103.28
1910.52	100.59	103.24

A and D (10.5)

1910.512	251°.55	155″.37
.529	251.50	155.74
1910.52	251.52	155.55

All of the comparison stars should show on the plates.

56 *Cygni* (5.2...11.2)

R. A. $20^{h}\,45^{m}\,49^{s}$ Decl. + 43° 39′

1907.312	45°.67	75″.39
.329	45.77	75.45
.348	45.58	75.54
1907.33	45.67	75.46

We have the following prior measures:

1852.63	45°.15	86″.03	1n	OΣ
1883.87	45.42	80.71	1n	HΣ
1907.33	45.67	75.46	3n	β

From which the proper motion of the large star is:

Measures	0″.194	in	41°.5
Auwers	0.171	in	48.8
Boss	0.178	in	44.0
Porter	0.180	in	45.9

DM (32°) 3980 (6.0...10.0)

R. A. $20^{h}\,49^{m}\,2^{s}$ Decl. + 32° 59′

1909.438	58°.33	187″.47
.458	58.30	187.36
.493	58.72	187.59
1909.46	58.45	187.47

Apparently unchanged.

1880.30	58°.05	187″.07	2n	Bl

It is evident from this, and from the meridian positions, that the proper motion, if any, is small.

Boss 0″.042 in 349°.6

DM (61°) 2068 (8.4...8.8)

R. A. $20^h\ 50^m\ 51^s$ Decl. + 61° 43′

A and B

1910.493	263°.12	85″.42
.509	263.03	85.34
.512	262.78	85.20
1910.50	262.98	85.32

B is DM (61°) 2067 with magnitude 8.8. Battermann gives the proper motion of 2068:

0″.76 in 180°

For comparison we have from meridian positions:

1875	247°.3	98″.7	A. G. Hels.

Assuming that B has no movement, the proper motion of A is:

0″.80 in 192°.9

It is highly probable that the smaller star is practically fixed in space; in this interest I have connected a faint star:

B and C (13)

1910.509	293°.10	60″.77
.512	293.53	60.51
1910.51	293.31	60.64

Lalande 40604 (7.8...10.0)

R. A. $20^h\ 52^m\ 24^s$ Decl. + 42° 26′

A and B

1908.383	351°.83	113″.26
.406	351.65	113.09
.422	351.58	113.21
1908.40	351.69	113.19

A and C (9.0)

1908.383	24°.62	156″.19
.406	24.25	155.91
.422	24.17	155.91
1908.40	24.35	156.00

C and D (10.2)

1908.383	356°.65	92″.40
.406	356.25	92.50
.422	356.13	92.51
1908.40	356.34	92.47

B and C

1908.422	69°.43	86″.10
.482	69.43	86.00
1908.45	69.43	86.05

For comparison we have the following measures:

AB	1893.98	354°.65	117″.50	2n	Eng
	1908.40	351.69	113.19	3n	β
AC	1894.01	25.00	160.11	2n	Eng
	1908.40	24.35	156.00	3n	β
CD	1893.98	356.08	93.14	1n	Eng
	1908.40	356.34	92.47	3n	β

Although the first position of CD depends upon a single measure, it is safe to assume that there is no sensible change, and that D has no proper motion.

The measures of AC give for the proper motion of Lalande 40604:

0″.349 in 42°.3

The movement from meridian observations seems to be too small:

A. G. Bonn	0″.273	in	41°.5
Porter	0.273	in	34.5

Both stars are given in A. G. Bonn for 1877, and the relative positions agree with the subsequent direct measures.

If the first position of AB has only the ordinary errors of observation, we have at last a small star with a sensible proper motion. These measures give for the motion of A:

0″.511 in 47°.4

This seems obviously too large. To determine hereafter whether B has any real motion, I have measured BC directly. The measures of AB and AC give:

BC	1908.40	69°.55	86″.12

Repeating the measures of BC and CD after a short interval, will show at once whether or not there is any real change in B.

[Since the foregoing was written, I have received from Prof. Donner the following measure from the astrographic plates:

1893.77	354°.6	116″.40	2n	Donner

It will be observed that a comparison of this with the recent measures gives a smaller value for the apparent motion of A:

0″.455 in 54°.4

Further measures will soon determine whether or not the small star has any motion.]

18 *Delphini* (5.6...10.2)

R. A. $20^h\ 52^m\ 39^s$ Decl. + 10° 23′

A and B

1907.293	162°.35	197″.74
.312	161.93	197.27
.348	161.83	197.79
1907.32	162.04	197.60

B and C (11.0)

1907.312	222°.9	66″.99
.348	223.3	67.32
1907.33	223.1	67.15

We have for AB:

1886.88	162°.50	197″.45	2n	Eng
1893.86	162.50	197.26	2n	Eng
1907.32	162.04	197.60	3n	β

It is evident there has been no change, and that the proper motion, whatever it is, is common to both stars. For future use, I have measured a third star.

Auwers	0″.097	in	235°.4
Boss	0.084	in	230.8

DM (40°) 4373 (7.7...10.8)

R. A. $20^h\ 53^m\ 59^s$ Decl. + 40° 54′

1909.493	351°.90	168″.52
.496	351.90	168.38
.512	351.77	168.76
1909.50	351.86	168.55

Very little if any change.

1880.16	352°.08	167″.89	2n	Bl

Groombridge 3357 (6.5...8.0)

R. A. $20^h\ 55^m\ 20^s$ Decl. + 39° 47′

A and B

1908.266	217°.13	136″.88
.383	217.40	137.21
.406	217.58	137.13
.422	217.30	137.16
1908.37	217.35	137.09

A and C

1908.406	145°.22	208″.38
.422	144.90	208.26
.425	145.03	208.48
1908.42	145.05	208.37

B and C

1908.406	107°.02	211″.89
.422	107.03	212.02
.425	107.08	212.60
1908.42	107.04	212.17

C and *c* (10.2...10.6)

1908.406	38°.62	8″.76
.422	39.03	8.62
.425	39.45	8.61
1908.42	39.03	8.66

The only other direct measures are of the large stars:

1893.80	217°.23	132″.70	2n	Eng

Assuming the fixity of the smaller component, the proper motion of Groombridge 3357 is:

0″.302 in 40°.8

From meridian observations this is given:

Stumpe	0″.307	in	48°.4
Groombridge	0.308	in	47.2
Porter	0.333	in	51.5

It would be generally unsafe to assume that a star of the magnitude of B was fixed, but in this instance from all the data it appears to have no sensible movement. To make this certain hereafter, I have measured a third small star from both A and B.

DM (33°) 4117 (9.2...12.9)

R. A. $20^h\ 55^m\ 50^s$ Decl. + 33° 26′

A and B

1910.512	204°.0	21″.13
.529	203.8	20.75
.531	203.0	20.82
1910.52	203.6	20.90

A and C (11.6)

1910.512	6°.5	87″.16
.529	7.4	87.21
.531	6.8	87.38
1910.52	6.9	87.25

The proper motion of the DM star is given:

Battermann 0″.31 in 177°.7

No other measures. The motion in A is confirmed by comparison with a brighter star *sp*.

A and DM (33°) 4144 (8.9)

1910.52	Δ R. A. — $75^s.25$	Δ Decl. — 6″.2	β
1875	— 75.46	— 18.1	A. G.

A and DM (33°) 4121 (9.1)

1910.51	Δ R. A. + $65^s.2$	Δ Decl. — 15″.9	β

3 *Equulei* (5.9...12.8)

R. A. $20^h\ 56^m\ 17^s$ Decl. + 6° 43′

1911.509	251°.73	80″.40
.545	251.90	81.14
.564	251.77	80.63
1911.54	251.80	80.72

The proper motion derived from the meridian positions is very uncertain:

Auwers	0″.007	in	270°.0
Boss	0.016	in	227.3

Lalande 40848 (8.0...6.7)

R. A. $20^h\ 58^m\ 23^s$ Decl. + 45° 24′

1908.266	134°.63	165″.55
.370	134.98	165.55
.383	135.13	165.72
1908.34	134.91	165.61

The larger star, B, is a very close pair (= β 1138). In my *General Catalogue* the proper motion of L 40848 is erroneously given to β 1138. The meridian positions give the latter no sensible motion. The only direct measures of these stars are the following:

1894.04	133°.15	167″.76	2n	Eng
1908.34	134.91	165.61	3n	β

These measures give for the proper motion of A, assuming the other to be fixed:

0″.388 in 66°.3

From transit observations we have:

Stumpe	0″.376	in	69°.7
Paris	0.401	in	70.9
Porter	0.365	in	68.6
A. G. Bonn	0.375	in	69.7

If the micrometer positions are combined with the relative positions in the catalogues of Weisse, O. Arg. N., A. G. Bonn and Porter, the most probable movement of A is:

0″.416 in 72°.4

For verification of the real motion, I have measured a very faint star near A.

A and *a* (12.8)

1908.266	67°.62	17″.18
.383	67.80	16.88
.406	68.55	17.09
1908.35	67.99	17.05

Lalande 40844 (8.6...10.7)

R. A. 20ʰ 59ᵐ 24ˢ Decl. + 6° 37′

A and B

1908.441	207°.22	105″.34
.444	207.15	105.40
.460	207.27	105.60
1908.45	207.21	105.45

A and C (9.1)

1908.441	119°.25	197″.77
.444	119.13	198.45
.460	119.17	198.49
1908.45	119.18	198.24

The first measures are:

AB	1891.85	204°.68	113″.03	1n	Eng
AC	1891.91	121.53	204.07	2n	Eng

The four sets of measures give for the annual movement of the principal star:

AB	R. A. + 0″.104	Decl. — 0″.557
AC	.085	.551
	+ 0.095	— 0.554

Therefore the proper motion of Lalande 40844 is:

0″.563 in 170°.3

This has been given:

Stumpe	0″.560	in	177°.9
Porter	0.529	in	178.2

4 *Equulei* (6.1...12.5)

R. A. 20ʰ 59ᵐ 30ˢ Decl. + 5° 29′

1911.487	275°.50	35″.85
.509	275.53	35.55
.526	275.10	35.40
1911.50	275.38	35.60

The proper motion is given:

Auwers	0″.159	in	217°.0
Boss	0.169	in	217.6

No other measures of the small star.

Piazzi XXI. 470 (8.0...12.9)

R. A. 21ʰ 1ᵐ 22ˢ Decl. — 6° 3′

1908.444	296°.50	41″.81
.479	296.03	42.14
.482	295.40	42.00
1908.47	295.98	41.98

No other measures of the small star. The proper motion of A is given:

Stumpe	0″.300	in	45°.6
Porter	0.324	in	45.2

DM (10°) 4481 (8.6...9.5)

R. A. 21ʰ 6ᵐ 17ˢ Decl. + 10° 9′

A and B

1908.422	357°.87	187″.02
.425	357.73	187.07
.444	357.73	186.85
1908.43	357.78	186.98

B and C (12.5)

1908.425	31°.45	19″.46
.444	30.08	19.45
.479	30.10	19.43
1908.45	30.54	19.45

No other measures of C. B is DM (10°) 4480. For AB we have:

1892.84	358°.62	187″.34	2n	Eng
1908.43	357.78	186.98	3n	β

These positions give for the proper motion of the principal star:

0″.175 in 80°.8

From meridian observations:

Stumpe	0″.200	in	90°.0
Porter	0.172	in	83.3

ζ *Cygni* (3.3...11.5)

R. A. 21ʰ 7ᵐ 50ˢ Decl. + 29° 44′

A and B

1907.463	204°.90	69″.06
.485	204.40	69.16
.502	204.00	68.79
1907.48	204.43	69.00

A and C (11.2)

1907.485	299°.53	90″.35
.502	299.52	90.44
1907.49	299.52	90.40

A and D (12.5)

1907.351	66°.00	102″.75
.465	66.02	102.78
.502	66.05	102.99
1907.44	66.02	102.84

Of these stars only D has been measured before:

1879.40	67°.2	101″.25	2n	β^2

From the two positions the proper motion of ζ *Cygni* is:

Measures	0″.094	in	193°.7
Auwers	0.055	in	196.4
Newcomb	0.061	in	182.3
Boss	0.059	in	182.5

Repeating the measures hereafter of all these stars will give a more accurate proper motion.

Lalande 41348 (8.5...9.3)

R. A. $21^h\ 11^m\ 50^s$ Decl. —0° 20′

A and B

1908.422	58°.15	179″.57
.425	58.30	179.87
.441	58.02	179.16
1908.43	58.16	179.53

B and C (12.2)

1908.422	116°.3	12″.13
.425	116.7	11.99
.441	116.5	11.74
1908.43	116.5	11.95

B is DM (—0°) 4196. Meridian positions are found in Lamont, Porter and A. G. Nico. The first micrometer position is from a single night, and therefore the correction to the proper motion is perhaps less certain.

1891.85	60°.27	184″.52	1n	Eng
1908.43	58.16	179.53	3n	β

From these positions the proper motion of Lalande 41348 is:

0″.502 in 112°.4

Some of the values from transit observations are given:

Stumpe	0″.464	in	111°.5
Porter	0.450	in	113.1
A. G. Nico.	0.478	in	116.1

The relation of the components in Lamont for 1853.7 is inconsistent with subsequent observations. There are no other measures of the faint star C.

α ***Cephei*** (2.8...10.6)

R. A. $21^h\ 15^m\ 42^s$ Decl. +62° 5′

A and B

1907.772	22°.27	206″.60
.788	22.42	206.89
.807	22.41	207.01
1907.79	22.37	206.83

B and CD

1907.772	172°.4	19″.71
.788	172.0	19.98
.791	171.5	19.92
1907.78	172.0	19.87

C and D (11.1...11.3)

1907.788	100°.8	2″.67
.791	107.8	2.57
1907.79	104.3	2.62

The only earlier measure is:

1879.41	23°.45	209″.22	2n	β^2
1907.79	22.37	206.83	3n	β

We have for the proper motion of α *Cephei:*

Measures	0″.162	in	81°.6
Newcomb	0.164	in	72.7
Auwers	0.150	in	80.4
Groombridge	0.149	in	71.6
Boss	0.160	in	72.1

DM (41°) 4134 (8.2...9.5)

R. A. $21^h\ 21^m\ 20^s$ Decl. +41° 12′

1909.342	296°.68	80″.85
.458	296.48	80.89
.473	296.45	80.89
1909.42	296.54	80.88

B is DM (41°) 4133. Probably fixed.

1878.64	296°.83	81″.45	2n	Bl

25 *Aquarii* (5.4...11.7)

R. A. $21^h\ 33^m\ 29^s$ Decl. + 1° 42′

1911.644	45°.56	132″.36
.663	45.66	132.68
.698	45.30	132.65
1911.67	45.51	132.56

No other measures. The proper motion is given:

Auwers	0″.085	in	212°.0
Boss	0.098	in	199.9

DM (37°) 4407 (Var...10.4)

R. A. $21^h\ 38^m\ 18^s$ Decl. + 37° 28′

1909.342	118°.02	141″.77
.378	118.20	141.76
.381	118.00	141.71
1909.37	118.07	141.75

The principal star is red, and variable 7 m to 9 m. The following measure is corrected for an error of 180° in the position-angle:

1878.65	118°.05	140″.86	2n	Bl

Oxford (Z 26°) 74272 (10.2)

R. A. $21^h\ 39^m\ 30^s.34$ Decl. + 26° 56′ 7″.4

This is DM (26°) 4251 (9.3). The place for 1900 is from a plate taken 1907.77 for the Oxford *Astrographic Catalogue.* The photographic positions give for the proper motion:

0″.348 in 240°.7

A and B (9.4...10.3)

1910.375	18°.73	124″.47
.397	18.67	124.65
.436	18.67	124.84
1910.40	18.69	124.65

A and DM (26°) 4256

1910.40	Δ R. A. $+79^s.01$	Δ Decl. — 122″.5	β
1875	78.30	127.8	A. G.

A and DM (26°) 4249

1910.40	Δ R. A. $-26^s.80$	Δ Decl. — 176″.3	β
1875	27.24	177.1	A. G.

The proper motion is doubtful at least. A later set of measures of AB will at once show what the fact is. The last comparison star is A 299.

Oxford (Z 26°) 74061 (8.4)

R. A. $21^h\ 39^m\ 38^s.05$ Decl. + 26° 3′ 32″.7

This star is DM (25°) 4607 (8.2). Place for 1900 from an Oxford plate taken 1907.77. The photographic positions give a proper motion:

0″.199 in 59°.4

A and B (8.2...12.9)

1910.436	319°.80	30″.98
.455	318.18	30.85
1910.44	318.99	30.91

A and DM (25°) 4602 (9.2)

1910.44	Δ R. A. $-40^s.1$	Δ Decl. — 85″.5	β
1875	39.6	81.3	A. G.

A and DM (25°) 4604 (9.3)

1910.44	Δ R. A. $-29^s.4$	Δ Decl. + 148″.4	β
1875	28.6	151.1	A. G.

DM (25°) 4602 and 4604

1910.44	32°.15	275″.43	2n	β
1875	32.6	275.8		A. G.

DM (49°) 3673 (9.1...11.1)

R. A. $21^h\ 50^m\ 48^s$ Decl. + 49° 56′

1909.342	258°.02	83″.80
.515	257.93	84.16
.531	258.05	84.38
1909.46	258.00	84.11

The larger star is red. The prior measures disagree in distance, but probably unchanged.

1876.94	258°.32	84″.55	1n	Bl
1879.45	257.90	83.28	1n	Bl

Lalande 42883 (7.4...13.8)

R. A. $21^h\ 53^m\ 22^s$ Decl. + 29° 15′

1909.458	133°.35	29″.94
.512	133.70	29.43
.515	134.10	29.92
1909.49	133.72	29.76

No other measures. The principal star has a large proper motion:

Stumpe	0″.570	in	224°.2
Porter	0.559	in	225.9
Paris	0.549	in	223.0

16 *Cephei* (5.2...12.0)

R. A. $21^h\ 57^m\ 32^s$ Decl. + 72° 37′

1910.551	174°.78	134″.12
.589	174.02	134.40
.605	173.99	134.40
1910.58	174.20	134.31

No other measures. For the proper motion we have:

Auwers	0″.187	in	200°.8
Boss	0.173	in	202.7

α *Aquarii* (3.0...12.0)

R. A. $21^h\ 59^m\ 37^s$ Decl. — 0° 54′

1907.463	41°.25	112″.80
.482	41.90	113.32
.523	41.22	113.04
1907.49	41.46	113.05

The proper motion of α *Aquarii* is very small, and altogether uncertain so far as the meridian observations are concerned. From the leading authorities we have:

Auwers (F. C.)	0″.012	in	279°.5
Auwers (A. N.)	0.008	in	248.2
Newcomb	0.014	in	98.3
Boss	0.015	in	114.0

The only measures of the small star are:

1879.50	41°.5	114″.64	2n	β^s
1907.49	41.46	113.05	3n	β

It seems certain that the motion of the large star is in the first quadrant, and nearly in the direction of the faint companion; and that the values from star catalogues are incorrect. A continuation of these measures will finally give the exact motion. The two positions now available give the proper motion:

0″.057 in 44°.5

ι *Pegasi* (3.8...11.2)

R. A. $22^h\ 1^m\ 26^s$ Decl. + 24° 46′

1907.312	220°.52	103″.53
.463	220.40	103.94
.482	220.55	103.67
.485	219.95	103.73
1907.43	220.35	103.71

The measures cover a period of more than half a century.

1852.80	213°.23	92″.10	3n	OΣ
1861.65	214.85	94.19	1n	OΣ
1883.82	217.85	98.35	1n	HΣ
1907.43	220.35	103.71	4n	β

The corrected proper motion of ι *Pegasi* is therefore:

0″.304 in 83°.4

From meridian observations:

Auwers	0″.284	in	85°.8
Newcomb	0.303	in	86.3
Boss	0.300	in	86.6

DM (49°) 3746 (6.9...13.3)

R. A. $22^h\ 3^m\ 37^s$ Decl. + 49° 13′

1910.490	272°.95	27″.52
.509	272.60	27.61
.512	272.85	27.48
1910.50	272.80	27.54

No other measures. No proper motion found in the star catalogues.

Bradley 2926 (5.4...10.5)

R. A. $22^h\ 7^m\ 29^s$ Decl. + 56° 14′

1907.312	34°.33	74″.81
.329	34.75	75.40
.348	34.50	74.94
.444	34.22	74.93
1907.36	34.45	75.02

For the proper motion we have:

1887.91	36°.47	80″.26	2n	Eng
1894.91	35.85	78.91	2n	Eng
1907.36	34.45	75.02	4n	β

From which the proper motion of the principal star is:

Measures	0″.296	in	63°.0
Auwers	0.269	in	61.8
Boss	0.270	in	62.0

ε *Cephei* (4.5...9.6)

R. A. $22^h\ 10^m\ 38^s$ Decl. + 56° 27′

1907.329	17°.85	129″.20
.348	17.63	129.12
.351	17.32	129.20
1907.34	17.60	129.17

The small star is DM (56°) 2744, and its place is given in A. G. The only direct measures are:

1887.91	21°.13	133″.29	2n	Eng
1894.91	19.72	132.00	2n	Eng
1907.34	17.60	129.17	3n	β

From a mean of the first two, compared with the last, we have for the proper motion of ε *Cephei:*

0″.467 in 82°.4

From meridian positions:

Auwers	0″.451	in	86°.1
Boss	0.452	in	84.4
Porter	0.438	in	84.9

35 *Pegasi* (5.0...10.5)

R. A. $22^h\ 21^m\ 47^s$ Decl. + 4° 6′

A and B

1907.444	210°.10	98″.09
.502	210.77	98.37
.523	209.68	98.79
1907.49	210.18	98.42

A and C (10.4)

1907.444	241°.45	181″.03
.502	241.55	181.25
.523	241.68	181.39
1907.49	241.56	181.22

B and C

1907.444	269°.13	109″.25
.502	269.68	109.49
.523	269.18	109.77
1907.49	269.33	109.51

We have the following measures:

AB	1886.70	207°.62	102″.71	2n	Eng
	1894.85	209.10	100.71	3n	Eng
	1907.49	210.18	98.42	3n	β
AC	1886.70	239.62	182.72	1n	Eng
	1894.84	240.53	181.32	2n	Eng
	1907.49	241.56	181.22	3n	β

From these positions the annual movement of the large star is:

AB	R. A. + 0″.090	Decl. — 0″.285
AC	.082	.293
	+ 0.086	— 0.289

The proper motion of 35 *Pegasi* is therefore:

0″.302 in 163°.4

From meridian positions:

Auwers	0″.306	in	169°.3
Porter	0.316	in	168.8
Boss	0.325	in	166.4

Groombridge 3804 (6.5...11.5)

R. A. $22^h\ 27^m\ 8^s$ Decl. + 39° 10′

A and B

1911.373	345°.22	32″.92
.392	345.40	32.91
.395	344.85	32.61
1911.39	345.16	32.81

A and C (11.2)

1911.373	156°.97	43″.61
.392	158.04	43.91
.395	157.37	43.62
1911.39	157.46	43.71

No other measures. The proper motion of the large star is small:

Groombridge	0″.017	in	125°.5
Boss	0.020	in	117.3

DM (53°) 2911 (9.6...12.8)

R. A. $22^{h}\,27^{m}\,47^{s}$ Decl. + 53° 10′

A and B

1912.427	209°.6	22″.95
.430	209.7	22.60
.465	209.5	23.25
1912.44	209.6	22.93

A and C (10.7)

1912.427	194°.23	48″.49
.430	194.80	48.45
.465	194.81	48.91
1912.44	194.61	48.62

From a comparison of photographic plates, Belanowsky (*Mitteilungen, Pulkowa* V) gives A a large proper motion:

1″.23 in 83°.1

I have, therefore, measured the nearest two stars, the larger of which should be on the photograph. A measure of that on the plate will at once settle the question of proper motion.

The nearest catalogue star, DM (52°) 3236, which is about 7′ *s* of the proper motion star, has a small companion not previously measured:

A and B (8.8...12.8)

1912.408	181°.1	16″.01
.427	181.6	16.02
1912.41	181.3	16.01

DM (64°) 1713 (7.3...9.2)

R. A. $22^{h}\,41^{m}\,46^{s}$ Decl. + 64° 40′

1909.438	240°.07	146″.61
.473	239.88	146.61
.496	240.26	146.84
1909.47	240.07	146.69

The smaller star is DM (64°) 1711. One of these stars, and presumably the larger, may have a small proper motion.

1878	240°.2	145″.9		A. G. Hels.
1879.15	239.77	145.01	2n	Bl

Groombridge	0″.081	in	87°.2

Lalande 44708 (8.0...9.5)

R. A. $22^{h}\,45^{m}\,26^{s}$ Decl. + 13° 20′

A and B

1908.460	337°.70	198″.94
.479	337.95	198.77
.556	337.74	199.08
1908.49	337.80	198.93

B and C (11.0)

1908.460	193°.17	106″.52
.479	193.37	106.45
.556	193.50	107.18
1908.48	193.35	106.72

B is DM (13°) 5005. For comparison we have the following measures of AB:

1853.68	343°.31	200″.56	2n	ΟΣ
1865.91	342.08	200.18	1n	ΟΣ
1883.73	340.22	199.59	1n	HΣ
1891.80	339.25	199.67	2n	Eng
1908.49	337.80	198.93	3n	β

Therefore the proper motion of Lalande 44708 is:

0″.357 in 66°.0

The value heretofore given from meridian observations appears to be too large:

Stumpe	0″.414	in	58°.2
Porter	0.444	in	58.8
Boss	0.474	in	63.2

I have measured a third star to make it certain hereafter that B has no motion.

60 *Pegasi* (6.4...8.7)

R. A. $23^{h}\,6^{m}\,0^{s}$ Decl. + 26° 12′

1909.381	294°.50	231″.09
.496	294.30	231.88
.512	294.33	231.13
1909.46	294.38	231.47

The prior measures are:

1853.77	292°.10	238″.43	2n	ΟΣ
1874.82	292.97	235.97	1n	ΟΣ

From these positions the corrected proper motion of 60 *Pegasi* is:

0″.209 in 239°.4

This has been given from meridian observations:

Auwers	0″.225	in	242°.2
Porter	0.236	in	240.6
Paris	0.207	in	239.6
Boss	0.229	in	237.8

As a further check on this movement, I have measured a much fainter star:

A and *a* (11.3)

1909.496	240°.20	86″.48
.515	240.70	86.81
.531	240.60	86.77
1909.51	240.50	86.69

Bradley 3077 (5.7...9.5)

R. A. 23^h 7^m 29^s Decl. + 56° 30′

1907.293	206°.57	104″.35
.329	206.37	104.80
.351	206.30	104.84
1907.32	206.41	104.66

The measures are ample in point of time:

1852.74	139°.53	102″.81	1n	OΣ
1853.10	140.22	101.93	1n	OΣ
1868.80	157.88	89.70	1n	OΣ
1882.76	177.12	87.36	1n	OΣ
1884.16	179.10	87.34	1n	HΣ
1887.91	183.88	88.35	2n	Eng
1907.32	206.41	104.66	3n	β

The corrected proper motion of the principal star is:

Measures	2″.093	in	82°.2
Auwers	2.094	in	82.2
Boss	2.102	in	81.9
Newcomb	2.109	in	81.9

Bradley 3084 (5.4...12.7)

R. A. 23^h 11^m 14^s Decl. + 52° 33′

1909.742	319°.22	123″.77
.744	319.27	124.16
.760	318.92	124.09
1909.75	319.14	124.01

No earlier measures. The proper motion of Bradley 3084 is given:

Auwers	0″.291	in	161°.5
Groombridge	0.275	in	155.5
A. G. Harv.	0.252	in	160.1
Boss	0.270	in	154.5

12 *Andromedae* (6.0...8.7)

R. A. 23^h 15^m 6^s Decl. + 37° 32′

A and B

1907.769	255°.62	120″.43
.772	255.70	120.44
.788	255.83	120.50
1907.77	255.72	120.46

B and C (12.0)

1907.788	213°.90	155″.84
.791	213.93	155.83
1907.79	213.91	155.83

We have the following measures:

1886.96	255°.65	118″.77	2n	Eng
1894.93	255.72	119.25	2n	Eng
1907.77	255.72	120.46	3n	β

The proper motion of the large star is:

Measures	0″.083	in	100°.1
Auwers	0.130	in	121.9
Boss	0.139	in	124.1

The difference is probably due to errors of observation; it is not likely that the small star has any motion. This will appear hereafter from a re-measurement of the third star.

DM (60°) 2532 (8.4...10.9)

R. A. 23^h 18^m 56^s Decl. + 60° 56′

A and B

1909.378	167°.07	44″.48
.438	167.23	44.36
.493	166.90	44.39
1909.44	167.07	44.41

A and C (10.8)

1909.378	354°.38	80″.88
.438	354.33	80.97
.493	354.27	80.66
1909.44	354.33	80.84

A and D (10.5)

1909.378	64°.37	130″.37
.438	64.05	130.51
.493	64.10	130.54
1909.44	64.17	130.47

A is the principal star of *h* 2238 (M 52). The first measures are somewhat discordant, especially in distance. Probably there is no change.

AB	1876.56	167°.13	44″.67	1n	Bl
	1880.02	166.20	43.83	1n	Bl
AC	1876.56	353.80	79.44	1n	Bl
	1880.02	354.38	81.24	1n	Bl
AD	1876.56	64.55	131.12	1n	Bl
	1880.02	64.50	130.58	1n	Bl

Oxford (Z 26°) 78862 (8.6)

R. A. 23^h 23^m 16^s.71 Decl. + 25° 22′ 40″.9

This star is DM (25°) 4940 (8.7). The place for 1900 is from the Oxford *Astrographic Catalogue*, plate taken 1907.77. The proper motion is given:

0″.148 in 42°.0

A and B (12.9)

1910.452	282°.9	39″.90
.455	284.0	39.49
1910.45	283.5	39.69

A and C (13.0)

1910.452	257°.2	53″.52
.455	257.1	53.34
1910.45	257.1	53.43

A and DM (25°) 4944 (8.8)

1910.45	Δ R. A. + 57^s.8	Δ Decl. — 142″.0	β
1875	58.3	142.8	A. G.

λ *Andromedae* (4.0...10.5)

R. A. $23^h\,31^m\,42^s$ Decl. + 45° 48′

A and B

1908.425	89°.03	217″.64
.444	88.75	218.23
.460	88.87	217.60
1908.44	88.88	217.62

A and *a* (13.3)

1908.425	198°.72	47″.74
.444	198.80	47.45
.460	199.18	47.44
1908.44	198.90	47.54

B and *b* (11.5)

1908.425	157°.95	68″.49
.444	157.90	68.31
.460	157.93	68.63
1908.44	157.93	68.48

The small stars have not been measured before. For AB we have:

1868.77	93°.18	222″.29	1n	OΣ
1882.76	91.91	220.24	1n	OΣ
1908.44	88.88	217.62	3n	β

The proper motion of the large star is:

Measures	0″.455	in	165°.6
Stumpe	0.455	in	158.8
Auwers	0.454	in	161.2
Newcomb	0.451	in	158.6
Boss	0.449	in	159.7

74 *Pegasi* (6.0...10.5)

R. A. $23^h\,32^m\,35^s$ Decl. + 16° 10′

A and B

1907.485	34°.77	98″.18
.523	35.05	98.32
.540	35.03	98.08
1907.52	34.95	98.19

B and C (12.0)

1907.485	238°.6	25″.68
.523	238.9	25.78
.540	239.3	25.65
1907.52	238.9	25.70

No other measures of the faint star C. Of the other we have:

1887.00	36°.07	100″.14	2n	Eng
1894.91	35.52	99.70	2n	Eng
1907.52	34.95	98.19	3n	β

From these positions the proper motion of 74 *Pegasi* is:

Measures	0″.128	in	78°.6
Auwers	0.112	in	96.2
Boss	0.120	in	90.9

ι *Piscium* (4.3...13)

R. A. $23^h\,33^m\,48^s$ Decl. + 4° 59′

1909.570	294°.30	70″.08
.592	294.77	69.70
.627	294.35	69.88
1909.60	294.47	69.89

The only other measure is:

1879.56	288°.0	54″.0	2n	β^s

These positions give for the corrected proper motion of ι *Piscium:*

0″.577 in 135°.0

This has been found from meridian observations:

Auwers	0″.561	in	141°.2
Newcomb	0.570	in	139.9
Boss	0.574	in	139.8

Piazzi XXIII. 164 (7.0...9.5)

R. A. $23^h\,37^m\,24^s$ Decl. + 57° 24′

A and B

1907.810	212°.81	99″.14
.845	212.75	99.46
.865	212.75	99.33
1907.84	212.77	99.31

A and C (9.5)

1907.810	138°.33	116″.70
.845	138.10	117.28
.865	137.75	116.88
1907.84	138.06	116.95

A and D (9.2)

1907.810	189°.70	164″.92
.845	189.73	165.34
.865	189.63	165.53
1907.84	189.69	165.26

A and E (9.5)

1907.810	123°.16	158″.71
.845	123.23	159.41
.865	122.90	159.18
1907.84	123.10	159.10

A and F (9.0)

1907.810	191°.00	218″.81
.845	190.85	219.13
.865	190.88	218.91
1907.84	190.91	218.95

The prior measures are:

AB	1894.18	212°.50	91″.50	2n	Eng
AC	1894.20	134.20	115.56	2n	Eng
AD	1894.18	188.52	158.33	2n	Eng
AE	1894.20	120.37	160.51	2n	Eng
AF	1894.15	190.07	211.57	2n	Eng

The motion of the large star is:

	R. A.	Decl.
AB	+ 0″.336	+ 0″.471
AC	.343	.471
AD	.319	.463
AE	.382	.421
AF	.326	.488
	.341	.463

Therefore the true proper motion is:

0″.575 in 36°.4

This is given from transit observations:

Stumpe	0″.608	in	39°.4
A. G. Hels.	0.618	in	40.1
Porter	0.605	in	36.7

ψ ***Andromedae*** (5.0...14.5)

R. A. $23^h\ 40^m\ 6^s$ Decl. + 45° 45′

A and B

1908.479	218°.7	24″.73
.518	218.1	24.80
1908.50	218.4	24.76

A and C (13.0)

1908.479	17°.2	61″.79
.518	17.2	62.19
.537	17.2	62.05
1908.51	17.2	62.01

A and D (9.0)

1908.444	151°.75	184″.18
.460	151.30	184.21
.479	151.83	183.81
1908.46	151.63	184.07

B and C have not been previously seen. D is DM (45°) 4322. For the relation of this to the principal star we have:

1874.8	151°.8	184″.53		A. G. Bonn
1879.79	151.89	183.23	2n	Bl
1894.70	151.90	184.06	2n	Donner

The position of 1894 is from astrographic plates.

As the proper motion of the large star is practically zero, there is no material relative change.

Auwers	0″.017	in	161°.9
Boss	0.022	in	145.1

PART II

MEASURES OF PROPER MOTION STARS IN THE GENERAL CATALOGUE OF DOUBLE STARS

β G. C. 7. β 1014. (7.0...12.5)

R. A. $0^h\ 1^m\ 24^s$ Decl. + 31° 0′

1908.583	335°.7	1″.47
.671	334.3	1.58
1908.63	335.0	1.52

These measures show that there has been no change since 1891. Some of the early measures have large errors in the position-angle. The proper motion, if any, is very small.

15. OΣ (App.) 256. (7.0...7.1)

R. A. $0^h\ 1^m\ 51^s$ Decl. + 30° 43′

1907.695	115°.87	105″.08
.711	115.86	105.03
.714	115.44	104.87
1907.71	115.72	104.99
1912.619	115°.70	105″.36
.622	115.60	105.24
.638	115.80	105.32
1912.62	115.70	105.31

The four sets of measures by Δ, Franz and β (1876-1912) give for the apparent motion of B:

0″.082 in 76°.5

As these stars are of about the same magnitude, the proper motion may be in either or both. I have, therefore, measured the nearest third star:

A and *a* (13.6)

1912.622	260°.1	20″.11
.638	259.0	20.20
1912.63	259.5	20.15

19. α *Andromedae.* Σ 13, App. II (2.0...11.2)

R. A. $0^h\ 2^m\ 11^s$ Decl. + 28° 26′

1911.471	275°.72	75″.17
.509	275.90	75.34
.529	275.75	75.44
.545	276.10	75.39
1911.51	275.87	75.33

These measures will not sensibly change the value given in the *General Catalogue* for the proper motion of α *Andromedae* from the positions 1836 to 1903.

Measures	0″.198	in	140°.3
Auwers	0.200	in	141.2
Newcomb	0.216	in	140.6
Boss	0.213	in	139.1

24. β *Cassiopeiae.* A. G. C. 15. (2.2...13.7)

R. A. $0^h\ 2^m\ 43^s$ Decl. + 58° 29′

1910.666	220°.1	23″.74
.678	217.5	23.82
.681	218.8	23.48
1910.67	218.8	23.68

A continuation of the measures of the small star will give an independent and better value of the proper motion of the bright star than that derived from meridian positions. With the time interval of 1889-1910 we have:

Measures	0″.564	in	109°.1
Auwers	0.550	in	110.2
Boss	0.558	in	108.9
Newcomb	0.560	in	108.8

32. O. Stone 1

R. A. $0^h\ 3^m\ 28^s$ Decl. — 14° 51′

There is an error in the Cincinnati place of this star. It is identical with Σ 3065 *rej* (No. 14). All the measures cited in G. C. Part II belong to Σ 3065 *rej.*

36. H 1939. (7...10)

R. A. $0^h\ 3^m\ 41^s$ Decl. + 10° 45′

1909.802	161°.6	34″.80
.936	161.1	34.65
1909.87	161.3	34.72

As the first position of these stars depends upon a single night, the apparent change in distance may not be real.

50. Hd 2. (7.5...12)

R. A. $0^h\,5^m\,6^s$ Decl. + 7° 17′

1907.540	117°.9	14″.75
.673	120.4	14.81
.675	119.3	15.06
1907.63	119.2	14.87
1909.742	119°.1	14″.91
.780	119.9	15.19
.782	118.8	15.05
1909.77	119.3	15.05

It appears now that change is not probable. All the other measures are given in Part II of the *General Catalogue.*

51. Espin 40. (8.8...12.3)

R. A. $0^h\,5^m\,9^s$ Decl. + 51° 24′

A and B

1907.695	73°.4	4″.56
.731	73.7	4.82
.750	71.2	4.46
1907.73	72.8	4.61

A and C (9.5)

1907.695	317°.5	24″.85
.731	316.9	24.55
.750	316.9	24.80
1907.73	317.1	24.73

Disagrees with prior measures of AC. The position from the *Astrographic Catalogue* is practically identical with the measures in 1907:

1902.80	316°.5	24″.60	Catania

55. Σ 8. (7.2...8.8)

R. A. $0^h\,5^m\,25^s$ Decl. — 3° 45′

1910.666	291°.9	7″.74
.681	292.3	7.75
.684	293.9	7.56
1910.68	292.7	7.68

No change since 1831.

57. H 1941. (11.0...11.2)

R. A. $0^h\,5^m\,31^s$ Decl. + 71° 51′

1910.529	193°.2	12″.32
.570	196.1	12.25
.586	193.7	12.23
1910.56	194.3	12.27

No other measures. *h* 8 is $2^m\,50^s$ *f* H 1941, with nearly the same declination. It has a 10.1 m star in the center like the planetary nebulae. Its place is found from the following stars:

h 8 and star 10.4 m

1910.529	238°.53	60″.54
.570	238.33	60.23
.586	238.42	60.10
1910.56	238.43	60.29

h 8 and DM (71°) 6

1910.529	194°.90	214″.05
.570	195.43	213.59
.586	195.23	213.88
1910.56	195.19	213.84

h 8 and DM (71°) 8

1910.529	61°.10	230″.43
.570	61.28	230.57
.586	60.85	230.29
1910.56	61.08	230.43

The only prior position is:

1886.68	61°.2	229″.83	Kobold

71. OΣ (App.) 1. (6.4...7.0)

R. A. $0^h\,7^m\,22^s$ Decl. + 75° 22′

1909.742	102°.85	76″.04
.744	102.73	76.38
.760	102.60	76.46
.763	102.52	76.39
1909.75	102.68	76.32

There may be a little proper motion in one.

1842	103°.3	78″.1		O. Arg. N.
1875	102.9	77.3		A. G. Kasan.
1875.79	102.4	77.07	3n	Δ
1882.83	102.4	76.87	5n	Franz

No proper motion found in the star catalogues.

99. H 1947. (7.3...10.5)

R. A. $0^h\,10^m\,3^s$ Decl. + 42° 58′

1910.666	75°.6	9″.01
.678	77.6	8.90
.681	74.0	9.15
1910.67	75.7	9.02

A small common proper motion. All the earlier measures are given in G. C. Part II. The proper motion of the principal star (Groombridge 30) is given:

Groombridge 0″.087 in 116°.7

113. Hd 10. (10.7...11.3)

R. A. $0^h\ 11^m$ ± Decl. + 3° 4′ ±

1908.652	237°.4	31″.52
.655	239.0	30.97
.709	238.8	31.21
1908.67	238.4	31.23

The note in the *General Catalogue* as to this pair following a 7.5 m star, belongs to Hd 13 (No. 124) as given in Part I. The distance of Hd 10 in the measure of 1903 is much too large.

116. 38 *Piscium.* Σ 22. (7.0...8.0)

R. A. $0^h\ 11^m\ 13^s$ Decl. + 8° 12′

A and C (12.5)

1910.684	141°.82	63″.51
.701	142.20	63.75
.703	141.88	63.86
1910.70	141.97	63.71

For proper motion of AB. Other values from meridian positions are:

Auwers	0″.109	in	20°.0
Boss	0.120	in	44.9
Hedrick	0.074	in	102.1

118. Σ 23. (7.6...9.9)

R. A. $0^h\ 11^m\ 20^s$ Decl. — 0° 21′

A and B

1911.545	329°.1	4″.71
.564	328.6	4.58
.583	329.3	4.86
1911.56	329.0	4.72

This, with the prior measures (1836-1911), gives for the proper motion of the principal star:

0″.121 in 15°.1

The movement from meridian positions is:

A. G. Nico. 0″.112 in 0°

For a further independent value, I have connected a faint star:

A and C (11.6)

1911.545	281°.40	103″.18
.564	281.30	102.95
.583	281.30	103.25
1911.56	281.33	103.13

119. Hd 11. (9.8...10.7)

R. A. $0^h\ 11^m\ 39^s$ Decl. + 3° 5′

1908.633	290°.5	36″.41
.636	291.4	36.34
.652	291.0	36.60
1908.64	291.0	36.45

It was obvious that one or the other of the prior single measures given in G. C. Part II of this star must be wrong. The distance in the measure of 1903 is about 1″ too large.

136. H 1951. (8.0...12.0)

R. A. $0^h\ 12^m\ 41^s$ Decl. — 11° 37′

1908.633	218°.4	22″.87
.652	217.7	22.98
.655	216.5	22.95
1908.65	217.5	22.93

The only earlier measures are my own, given in G. C. Part II. As the first position depends upon a single night, the apparent change in distance may not be real.

141. ι *Ceti.* H 1953. (3.7...12)

R. A. $0^h\ 13^m\ 19^s$ Decl. — 9° 30′

1910.666	16°.90	63″.74
.681	17.08	63.02
.701	16.95	63.58
1910.68	16.98	63.45

Comparing this with the first position in 1880, we have for the proper motion of ι *Ceti:*

0″.072 in 243°.8

Other values from meridian positions are:

Auwers	0″.049	in	237°.9
Boss	0.037	in	209.0
Newcomb	0.035	in	212.5

144. S 384. (6.8...9.3)

R. A. $0^h\ 13^m\ 44^s$ Decl. + 37° 34′

1910.666	19°.30	71″.39
.678	18.83	71.29
.681	18.90	71.31
1910.67	19.01	71.33

The proper motion of A from the measures of AB, and from the star catalogues is:

Measures	0″.309	in	206°.1
Stumpe	0.332	in	207.0
Porter	0.304	in	211.9

There is no indication or probability that the smaller star has any sensible proper motion, but I have measured a much fainter and nearer star:

A and *a* (13.5)

1910.678	267°.0	20″.78
.684	266.5	20.30
.739	267.5	20.73
1910.70	267.0	20.60

158. Hd 14. (9.5...13.5)

R. A. $0^h\ 15^m\ 12^s$ Decl. + 7° 22′

1907.772	157°.3	51″.13
9.703	158.6	51.50
1908.74	158.0	51.31

No other measures of these stars.

165. *42 Piscium.* Σ 27. (6.8...10.7)

R. A. $0^h\ 16^m\ 13^s$ Decl. + 12° 49′

1908.613	332°.1	29″.05
.633	333.3	29.23
.636	332.0	29.08
.652	331.9	29.00
1908.63	332.3	29.09

The six positions on 20 nights by Σ, Δ, H I and β (1829-1908) give for the corrected proper motion of 42 *Piscium:*

0″.083 in 46°.3

Meridian positions give:

Auwers	0″.051	in	46°.3
Boss	0.063	in	65.5

169. H 1959. (8.5...10.2)

R. A. $0^h\ 16^m\ 23^s$ Decl. + 21° 0′

1909.630	286°.3	27″.40
.687	286.1	27.20
1909.66	286.2	27.30

No other measures. Distant about 50′ *np* H 1959 is *h* 17, and *h* 16 is *sp* that. In the field with the first are several small stars.

h 17 and star 10.5 m

1909.630	154°.9	56″.44
.649	154.8	57.71
1909.64	154.8	57.07

h 17 and star 10.6 m

1909.630	84°.0	82″.68
.649	80.4	80.54
1909.64	82.2	81.61

h 17 and star 10.6 m

1909.630	102°.0	94″.77
.649	101.7	93.81
1909.64	101.8	94.29

The nebula is too diffused for accurate bisection, and *h* 16 has no good comparison star. The following positions are from differences in R. A. and Decl.:

1887.88	156°.4	53″.2	1n	Eng
.88	82.0	76.4	1n	Eng
.88	101.6	90.7	1n	Eng

174. Hd 15. (9.7...10.7)

R. A. $0^h\ 16^m\ 54^s$ Decl. + 7° 36′

1907.772	270°.1	25″.58
.845	270.5	25.56
1907.81	270.3	25.57

There seems to be a large error in the single measure in 1903.

179. Hd 16. (8.5...11.0)

R. A. $0^h\ 17^m\ 47^s$ Decl. + 3° 6′

1910.838	290°.08	56″.93
.856	290.37	56.53
.893	290.13	57.54
1910.86	290.19	57.00

The apparent change in distance is not confirmed; but further measures should be made ten or twenty years hence.

197. OΣ 9. (7.0...10.2)

R. A. $0^h\ 19^m\ 40^s$ Decl. + 56° 7′

A and C

1910.627	4°.6	22″.52
.644	4.0	22.55
.666	3.7	22.76
1910.65	4.1	22.61

The apparent large change in angle can not be real; probably error in early measure.

204. Hd 19. (9.6...13.2)

R. A. $0^h\ 20^m\ 35^s$ Decl. + 7° 3′

1907.772	325°.6	35″.18
9.703	326.5	34.76
1908.74	326.0	34.97

No other measures. The measure given in G. C. Part II belongs to some other star.

205. Σ 30. (6.8...8.7)

R. A. $0^h\ 20^m\ 43^s$ Decl. + 49° 19′

A and C (12.7)

1910.818	97°.77	63″.96
.838	97.75	64.13
.856	97.83	63.81
1910.84	97.78	63.97

For an independent value of the proper motion of A. The measures of AB (1831-1903) give for the motion of the principal star:

0″.054 in 268°.0

From meridian positions:

Groombridge 0″.006 in 30°.6

The smaller component of Σ 30 may have some motion.

212. OΣ 10 *rej.* (5.8...9.2)

R. A. $0^h\ 21^m\ 16^s$ Decl. + 15° 22′

A and B

1907.731	238°.10	101″.47
.750	237.92	101.50
.772	237.88	101.55
1907.75	237.97	101.51

A and DM (15°) 60

1907.750	154°.23	275″.73
.772	154.27	276.61
1907.76	154.25	276.17

B and *b* (13.7)

1907.845	157°.64	153″.29
.865	157.20	153.49
1907.85	157.42	153.39

The proper motion in the *General Catalogue* from A. G. Berlin is given with the wrong sign in R. A., and should read:

0″.092 in 73°.6

The corrected proper motion of A from the four sets of measures by Δ, Doo and β (1866-1907) is:

0″.132 in 104°.7

It is not probable that B has any motion of its own. For further certainty the nearest small star is connected with it.

216. H 1968. (8.0...10.0)

R. A. 0ʰ 21ᵐ 33ˢ Decl. — 17° 4′

A and B

1907.675	189°.1	2″.58
.692	188.4	2.57
1907.68	188.7	2.57
1911.564	202°.6	3″.87
.583	204.9	3.75
.663	201.9	3.60
1911.60	203.1	3.74

A and C (11.7)

1907.673	122°.73	90″.69
.675	122.70	90.91
.692	122.88	90.73
1907.68	122.77	90.78

The proper motion of A from meridian positions is too large. The six sets of measures of the small star by Aitken and β (1891-1907) give:

Measures	0″.226	in	88°.4
Stumpe	0.252	in	92.1
Porter	0.276	in	85.2

The following later position will not materially change the value given:

A and C

1910.933	122°.47	90″.11
11.564	122.45	90.81
11.583	123.05	90.49
11.663	122.71	90.19
1911.44	122.67	90.40

228. H 623. (10.8...10.9)

R. A. 0ʰ 22ᵐ 40ˢ Decl. + 2° 11′

A and B

1909.760	342°.1	19″.82
.763	341.8	19.54
.780	342.4	19.30
1909.77	342.1	19.55

No other measures.

H 623 (B) and *h* 23

1909.760	24°.7	46″.54
.763	24.5	46.25
.780	24.7	45.80
1909.77	24.6	46.20

There are four other nebulae, *h* 25 and three by Rosse, closely following.

236. β 1094. (5.7...9.5)

R. A. 0ʰ 23ᵐ 29ˢ Decl. + 59° 19′

A and C (11.5)

1912.638	338°.33	119″.85
.660	338.34	120.45
.675	337.45	120.63
1912.66	338.04	120.31

No other measures of C. The only proper motion found for the large star is:

Boss 0″.047 in 136°.7

239. 28 *Andromedae.* β 1095. (5.5...13.3)

R. A. 0ʰ 23ᵐ 47ˢ Decl. + 29° 5′

A and C (11.6)

1912.638	129°.57	142″.42
.675	129.92	142.44
.678	129.72	142.35
1912.66	129.74	142.40

Faint star measured for the proper motion of the physical system. No other observations.

Auwers	0″.061	in	159°.8
Boss	0.066	in	143.5

242. 12 *Ceti.* H 322. (6.0...11.0)

R. A. 0ʰ 23ᵐ 55ˢ Decl. — 4° 37′

1908.728	188°.4	9″.86
.824	190.4	9.63
.826	190.1	9.75
1908.79	189.6	9.75

The proper motion of the large star from meridian positions is small and very uncertain in direction:

Auwers	0″.010	in	206°.5
Boss	0.010	in	133.0
Newcomb	0.017	in	91.4

The corrected value from the five sets of measures on 15 nights (1866-1908) is:

0″.034 in 37°.9

246. Espin 2. (8.8...9.5)

R. A. $0^h\ 24^m\ 30^s$ Decl. + 56° 8′

1907.750	114°.0	5″.74
.788	114.0	5.80
.791	114.0	5.93
1907.78	114.0	5.82

The only other measures are those in Part I of the *General Catalogue.*

254. β 1158. (6.9...8.3)

R. A. $0^h\ 24^m\ 55^s$ Decl. — 10° 45′

A and BC

1912.695	86°.83	79″.26
.717	86.86	78.73
.755	86.80	79.21
1912.72	86.83	79.07

Neither star has any considerable proper motion.

258. H 5451. (5.7...8.5)

R. A. $0^h\ 25^m\ 3^s$ Decl. + 32° 55′

1911.545	84°.90	55″.85
.564	85.60	56.21
.583	85.13	56.37
1911.56	85.21	56.14

Not given in Boss' *General Catalogue.* No sensible relative change since 1875.

262. OΣ 13. (7.8...10.9)

R. A. $0^h\ 25^m\ 26^s$ Decl. + 36° 18′

A and C (12.5)

1908.843	164°.7	29″.09
.845	162.9	29.30
.862	164.2	29.30
1908.85	163.9	29.23

A and D (10.5)

1908.843	179°.3	41″.42
.845	179.0	41.27
.862	180.5	41.44
1908.85	179.6	41.38

The measures of these stars so far show no sensible proper motion in A.

269

This is identical with No. 246 of the *General Catalogue.*

270. A 111. (8.5...13.0)

R. A. $0^h\ 26^m\ 0^s$ Decl. — 5° 49′

A and B

1908.671	212°.4	2″.19
.824	208.7	1.89
.920	207.6	1.90
1908.80	209.6	1.99

These measures show that the small star has the same proper motion as the other.

Porter 0″.38 in 99°

For an independent determination of this hereafter, I have measured a distant star 10.7 m. The faint nebula *sp* in a low-power field is *h* 27.

A and C

1908.750	195°.37	112″.90
.824	195.61	112.89
.826	195.22	113.05
1908.80	195.40	112.95

275. 52 *Piscium.* H 1982. (5.5...12.0)

R. A. $0^h\ 26^m\ 18^s$ Decl. + 19° 38′

1907.657	303°.8	42″.15
.673	304.0	42.01
.675	303.1	41.86
.692	303.6	41.86
1907.67	303.6	41.97
1911.602	303°.5	42″.51
.622	302.9	42.58
.625	303.0	42.82
1911.62	303.1	42.64

From the measures (1879-1911) the proper motion of 52 *Piscium* is:

0″.149 in 103°.2

This is given from meridian places:

Auwers	0″.121	in	109°.3
Boss	0.138	in	112.0

276. β 1310. (7.3...13.1)

R. A. $0^h\ 26^m\ 21^s$ Decl. + 22° 32′

A and C (12.8)

1911.644	297°.1	16″.39
.663	297.9	16.05
.720	297.7	15.90
1911.67	297.6	16.11

A and D (9.4)

1911.644	146°.20	96″.12
.663	146.31	96.44
.720	146.35	96.16
1911.67	146.29	96.24

From the measures of these faint stars (1903-1911) we have for the motion of A:

AC	R. A. + 0″.141	Decl. + 0″.046
AD	0.159	0.066
	+ 0.150	+ 0.056

Therefore the proper motion of the principal star is:

0″.160 in 69°.5

The values heretofore given are too large:

Stumpe	0″.205	in	86°.6
Paris	0.235	in	90.0

279. OΣ 14. (6.7...10.7)

R. A. $0^h\ 26^m\ 29^s$ Decl. + 27° 37′

A and B

1912.583	159°.1	8″.63
.619	158.6	8.60
.622	159.4	8.61
1912.61	159.0	8.61

A and C (12.6)

1912.619	84°.27	59″.95
.622	84.60	60.11
1912.62	84.43	60.03

No sensible change in AB in the last half-century. No other measures of C.

The proper motion of A is too small to be certain from meridian positions.

Boss 0″.015 in 65°.7

281. H 1033. (10.3...10.3)

R. A. $0^h\ 26^m\ 38^s$ Decl. + 62° 37′

1907.562	222°.6	7″.09
.578	224.0	6.81
.581	223.4	6.91
1907.57	223.3	6.94
1910.529	222°.1	6″.79
.586	224.1	6.79
1910.56	223.1	6.79

Probably fixed. H 1033 is in *h* 28; small stars.

299. Hd 23. (9.5...12)

R. A. $0^h\ 28^m\ 28^s$ Decl. + 3° 13′

1907.581	133°.4	35″.76
.636	132.9	36.25
.638	133.0	36.05
1907.62	133.1	36.02
1909.760	132°.9	35″.80
.780	133.3	35.71
.782	133.2	35.38
1909.77	133.1	35.63

The former measures give a much smaller distance. No other pair found near this.

304. Σ 38. (8.3...8.7)

R. A. $0^h\ 28^m\ 41^s$ Decl. + 58° 1′

1908.788	145°.0	16″.87
.804	145.5	17.00
.826	144.5	16.93
1908.81	145.0	16.93
1909.742	144°.1	16″.98
.744	144.6	16.99
.760	144.7	16.90
1909.75	144.5	16.96

Certainly unchanged.

314. 13 *Ceti.* β 490. (5.5...6.2)

R. A. $0^h\ 29^m\ 4^s$ Decl. — 4° 15′

AB and C (12.5)

1908.826	50°.2	28″.17
.884	51.5	27.92
.939	51.5	28.46
1908.88	51.1	28.18
1910.608	49°.9	27″.16
.627	50.1	27.64
.666	51.1	27.79
.701	50.3	27.36
1910.65	50.3	27.49
1911.720	50°.2	27″.30
.777	49.3	27.23
.835	49.6	27.07
.870	50.5	27.55
1911.80	49.9	27.38

The ten positions of this very faint star (1877-1911) should give the proper motion of the binary system with substantial exactness:

0″.416 in 95°.2

The correction to the former values is small.

Auwers	0″.397	in	93°.0
Boss	0.408	in	92.6
Newcomb	0.409	in	92.4

319. A. G. 6. (8.2...10.0)

R. A. $0^h 29^m 16^s$ Decl. + 11° 11′

1906.772	10°.7	60″.29
6.813	11.0	60.08
7.502	11.4	60.85
7.540	11.1	60.53
1907.16	11.0	60.44

Distance increasing, and evidently a small proper motion in A, the value of which will appear from further measures.

1892.84	10°.2	58″.43	1n	Leip.
1902.84	10.3	59.44	3n	Miller

322. Σ 42. (7.9...8.7)

R. A. $0^h 29^m 38^s$ Decl. + 29° 21′

A and C (10.8)

1909.742	205°.65	33″.68
.744	206.17	33.94
.760	206.28	33.49
.763	205.78	33.72
1909.75	205.97	33.71
1911.622	206°.23	33″.17
.625	206.73	33.17
.644	206.81	33.17
1911.63	206.59	33.17

In G. C. Part II, direction of the motion of A, for 165°.8 read 154°.8. The six positions by OΣ, Eng, A and β give for the proper motion of the large star:

0″.446 in 154°.6

From meridian observations:

Porter 0″.449 in 159°.8

326. Espin —. (8.9...10.5)

R. A. $0^h 28^m 17^s$ Decl. + 55° 56′

Identified as DM (55°) 109.

1907.463	157°.1	8″.15
.485	156.9	8.25
1907.47	157.0	8.20

This is identical with No. 297 of the *General Catalogue.* The correct place is given here.

333. Hd 29. (7.8...9.2)

R. A. $0^h 31^m$ ± Decl. + 1° 26′ ±

There is no bright star in or near this place, and nothing found answering the description at Harvard and Kirkwood.

341. Hd 31. (7.6...11.5)

R. A. $0^h 31^m 56^s$ Decl. — 1° 10′

1907.636	307°.7	30″.40
.675	307.3	30.40
.810	307.1	30.40
1907.71	307.4	30.40

Common proper motion?

If the principal star has the given proper motion of 0″.087 in 253°.4, the two are moving together.

345. OΣ (App.) 5. (6.2...8.0)

R. A. $0^h 32^m 4^s$ Decl. + 76° 13′

1908.709	143°.75	116″.68
.711	143.21	116.05
.728	143.33	116.27
1908.72	143.43	116.33

The relative change, if any, is small. No proper motion found in the star catalogues.

346. Σ 45. (7.0...10.0)

R. A. $0^h 32^m 7^s$ Decl. + 46° 18′

A and B

1911.793	87°.7	13″.00
.813	86.8	13.14
.835	87.2	13.34
1911.81	87.2	13.16

The measures by Σ, Δ, A and β (1829-1911) give for the proper motion of A:

0″.052 in 275°.9

The meridian positions give:

Greenwich 0″.045 in 268°.7

A faint star is connected for a further independent value of this movement:

A and C (13.0)

1911.813	261°.30	110″.25
.835	260.70	109.67
.870	261.33	109.44
1911.84	261.11	109.80

349. OΣ 16. (6.3...10.8)

R. A. $0^h 32^m 32^s$ Decl. + 48° 42′

1907.523	22°.8	13″.79
.540	23.3	13.59
.562	22.6	13.45
1907.54	22.9	13.61

Some change from proper motion. The proper motion of A (Groombridge 113) is given:

Groombridge	0″.011	in	169°.7
Boss	0.019	in	133.2

354. δ *Andromedae*. β 491. (3.4...12.5)

R. A. $0^h 32^m 54^s$ Decl. + 30° 12′

1907.523	300°0	28″27
.540	299.7	28.19
.578	299.1	28.25
.692	299.4	27.97
1907.58	299.5	28.17

1910.701	299°9	28″04
.703	298.9	28.04
.739	301.2	28.01
1910.71	300.0	28.03

The proper motion of δ *Andromedoe* is:

Auwers	0″147	in	123°0
Boss	0.163	in	121.8

As it is certain now that the small star is moving with the other, I have measured a third and much fainter star:

A and C (15.2)

1910.742	109°8	47″50
.760	111.5	47.55
.780	110.8	47.52
1910.76	110.7	47.52

361. α *Cassiopeiae*. (2.0...14.5)

R. A. $0^h 33^m 42^s$ Decl. + 55° 53′

A and C (13.5)

1908.785	105°1	38″30
.788	103.9	38.13
.804	105.4	38.39
1908.79	104.8	38.27

A and D (9.5)

1908.655	280°26	64″16
.673	280.22	64.06
.689	280.09	64.23
.692	280.02	64.06
1908.68	280.15	64.13

From the measures of D by OΣ and β on 29 nights, the real proper motion of the large star is:

0″054 in 116°4

It is specially important that the measures of AC should be continued.

The proper motion is given from meridian observations:

Auwers	0″048	in	142°2
Newcomb	0.061	in	121.0
Boss	0.060	in	121.2

362. H 1044. (8.5...8.6)

R. A. $0^h 33^m 44^s$ Decl. + 43° 3′

1907.523	319°4	21″73
.540	319.0	21.97
.581	319.0	21.88
1907.55	319.1	21.86

No change.

378. H 1046. (10.6...11.0)

R. A. $0^h 36^m 25^s$ Decl. + 61° 8′

A and B

1910.605	65°1	16″13
.608	66.3	16.17
.627	67.4	16.04
1910.61	66.3	16.11

A and C (10.8)

1910.605	334°2	52″87
.608	334.2	52.82
.627	333.9	52.86
1910.61	334.1	52.85

H 1046 is in *h* 52. In G. C. Part II, angle of AC, *for* 355°0 *read* 335°0.

384. Σ 53 *rej.* (8.0...8.7)

R. A. $0^h 37^m 18^s$ Decl. — 1° 32′

A and B

1907.845	340°4	28″80
8.000	341.0	28.89
8.044	340.8	28.38
1907.96	340.7	28.69

The five positions by Eng., A and β (1891-1907) give for the proper motion of the primary:

0″252 in 212°7

This movement from meridian observations is somewhat uncertain in amount.

Porter	0″415	in	216°6
Kustner	0.375	in	221.7
A. G. Nico.	0.301	in	228.4
Bauschinger	0.453	in	223.9

The companion star, however, is large enough to have possibly a small motion of its own; and I have connected with it a third star. A set of measures a few years hence will show at once whether or not B is fixed.

B and C (12.5)

1907.845	25°03	128″39
8.000	24.18	128.31
8.597	26.08	128.08
1908.15	25.10	128.26

391. 21 *Cassiopeiae*. H N. 122. (5.7...9.7)

R. A. $0^h 37^m 44^s$ Decl. + 74° 20′

1910.605	159°83	35″34
.608	159.95	35.63
.627	160.25	35.95
1910.61	160.01	35.64

Further measures are required to show whether or not these stars are moving together.

The proper motion of 21 *Cassiopeiae* is small.

Auwers	0″050	in	224°4
Newcomb	0.033	in	217.2

395. o *Cassiopeiae.* β 231. (4.9...12.0)

R. A. $0^{h}\ 38^{m}\ 2^{s}$ Decl. + 47° 38′

1911.468	303°.00	32″.72
.509	303.50	32.71
.529	302.90	32.76
1911.50	303.13	32.73

No sensible change since 1888. The proper motion of the large star, if any, is very uncertain.

Auwers (F. C.)	0″.016	in	190°.7
Auwers (Cor'd)	0.018	in	146.0
Boss	0.023	in	102.7
Newcomb	0.029	in	102.6

397. A. G. 7. (9.7...11.0)

R. A. $0^{h}\ 38^{m}\ 8^{s}$ Decl. + 11° 56′

1908.750	318°.4	21″.52
.788	317.5	21.32
.824	319.0	20.91
1908.79	318.3	21.25

Early measures disagree in distance.

400. H 6

This is identical with the last preceding pair, A. G. 7.

401. β 492. (6.0...12.0)

R. A. $0^{h}\ 38^{m}\ 27^{s}$ Decl. + 54° 34′

A and B

1909.821	150°.8	2″.29

A and C (10.9)

1909.818	23°.87	88″.30
.821	23.23	88.28
.838	23.53	88.44
1909.83	23.54	88.34

Distant star measured for proper motion of A, which is given:

A. G. Harv.	0″.066	in	317°.3
Boss	0.027	in	250.3
Groombridge	0.020	in	232.8

There is no change in AB.

403. Arg 2. (8.0...9.0)

R. A. $0^{h}\ 38^{m}\ 59^{s}$ Decl. + 54° 20′

A and B

1907.463	118°.3	13″.38
.465	118.9	13.15
.485	118.8	12.96
1907.47	118.7	13.16

A and C (12.5)

1907.463	93°.5	26″.24

The measure by Espin of this star is from B.

408. H 7. (10.0...11.3)

R. A. $0^{h}\ 39^{m}\ 14^{s}$ Decl. + 11° 55′

1908.750	308°.4	21″.12
.788	308.4	21.06
.824	308.0	20.97
1908.79	308.3	21.05

This is DM (11°) 90. Error of 180° in Herschel. No other measures. No. 397, which is *np* H 7, is a very similar pair in all respects.

415. Σ I, App. I. (6.7...6.7)

R. A. $0^{h}\ 39^{m}\ 58^{s}$ Decl. + 30° 17′

1907.638	51°.65	46″.56
.673	51.50	46.41
.675	51.76	46.58
1907.66	51.64	46.52

The only change since 1834 is a possible decrease in the angle.

417. H V. 82. (7.7...8.0)

R. A. $0^{h}\ 40^{m}\ 38^{s}$ Decl. + 50° 27′

A and B

1909.742	76°.26	51″.27
.744	76.57	51.44
.760	76.32	51.34
1909.75	76.38	51.35

A and C (12.2)

1909.742	280°.62	104″.72
.744	280.53	104.32
.760	280.68	104.75
1909.75	280.61	104.60

Small star measured to determine hereafter whether the proper motion is in A or B.

The apparent motion of B from the measures (1875-1909) is:

0″.050 in 55°.2 (± 180°)

432. Hd 35. (8.7...9.3)

R. A. $0^{h}\ 42^{m}\ 28^{s}$ Decl. — 2° 25′

1909.627	36°.6	6″.96
.703	35.0	6.96
.706	35.8	6.91
1909.68	35.8	6.94

The nebula about 35′ distant *sf* is diffused but brighter in the middle, so that the bisection is fairly exact.

h 67 and SD (2°) 111

1909.627	113°.8	89″.47
.703	113.6	89.41
.706	115.0	89.65
1909.68	114.1	89.51

437. OΣ (App.) 9. (7.0...7.7)

R. A. $0^{h}\,43^{m}\,21^{s}$ Decl. + 29° 48′

A and B

1908.652	237°.07	97″.86
.655	237.30	97.45
.673	237.45	97.51
1908.66	237.27	97.61

The measures of Δ and β in 1901 give the relative motion of A as in Part II of the *General Catalogue:*

0″.217 in 92°.1

A and C

1908.652	323°.08	107″.39
.655	323.37	107.33
.673	323.50	107.33
1908.66	323.32	107.35

The only other measure of AC is:

1892.03 324°.52 105″.70 2n Eng.

Assuming C to be fixed, as it probably is, the proper motion of A from the two positions is:

0″.167 in 90°.5

To determine this hereafter, I have measured a small star from C:

C and *c* (9.6...11.1)

1908.652	218°.8	19″.50
.655	220.1	19.74
.673	220.0	19.73
1908.66	219.6	19.66

The meridian values appear to be too large:

Stumpe	0″.322	in	105°.3
Porter	0.263	in	100.3
Rechenberg	0.267	in	103.7

444. Σ 63. (8.2...11.2)

R. A. $0^{h}\,43^{m}\,56^{s}$ Decl. + 11° 11′

A and B

1907.879	231°.57	18″.70
7.961	231.68	18.49
8.000	231.60	18.51
1907.95	231.62	18.57

From the measures of AB the principal star has a proper motion of:

0″.162 in 87°.7

B and C (11.6)

1907.879	313°.73	124″.71
7.961	314.30	124.37
8.000	313.70	124.13
1907.95	313.91	124.40

The third star C is connected for the purpose of determining hereafter whether any of the proper motion of the system is in the small star B. The later measures indicate no change in BC:

1912.545	313°.83	124″.32
.562	314.08	124.42
.619	313.73	124.79
1912.57	313.88	124.51

453. H 628. (7.7...11.5)

R. A. $0^{h}\,45^{m}\,25^{s}$ Decl. + 33° 14′

1911.777	68°.93	42″.61
.813	68.95	42.56
.832	69.18	42.36
1911.81	69.02	42.51

The only other measures are recent, and show no change.

458. β 497. (6.0...9.0)

R. A. $0^{h}\,45^{m}\,55^{s}$ Decl. + 60° 28′

A and B

1908.652	170°.68	126″.68
.655	170.93	126.86
.673	171.12	127.20
.689	171.06	127.20
1908.67	170.95	126.98

The six positions by Eng. and β give for the proper motion of the large star (Bradley 90):

0″.181 in 340°.5

Other values from meridian observations are:

Auwers	0″.152	in	328°.9
Porter	0.175	in	331.2
Boss	0.188	in	337.5

467. Σ 70. (7.0...10.0)

R. A. $0^{h}\,46^{m}\,52^{s}$ Decl. + 52° 2′

A and C

1909.742	148°.55	78″.95
.744	148.77	78.74
.760	148.52	78.83
1909.75	148.61	78.84

C and *c* (10.6...11.0)

1909.742	88°.9	1″.55
.744	88.6	1.49
1909.74	88.7	1.52

No other measures of these stars.

No change in AB. The proper motion of A is given:

Greenwich 0″.081 in 105°.7

475. *υ′ Cassiopeiae.* β 1098. (6.0...14.0)

R. A. 0ʰ 47ᵐ 53ˢ Decl. + 58° 19′

A and C (12.8)

1912.504	128°.13	93″.69
.507	127.60	93.54
.545	127.78	93.54
1912.52	127.84	93.59

The amount of the movement of the large star is uncertain:

Auwers	0″.106	in	221°.2
Boss	0.053	in	214.1
Groombridge	0.061	in	227.4

479. *66 Piscium.* OΣ 20. (5.9...7.0)

R. A. 0ʰ 48ᵐ 14ˢ Decl. + 18° 32′

AB and C (12.8)

1912.562	9°.72	150″.48
.619	9.53	151.05
.622	9.64	151.13
1912.60	9.63	150.89

For the proper motion of the binary system. This is uncertain from the star catalogues.

Auwers	0″.017	in	246°.0
Boss	0.026	in	119.8

486. H 629. (8.8...11.3)

R. A. 0ʰ 48ᵐ 59ˢ Decl. + 33° 54′

A and B

1907.638	70°.7	10″.58
.673	71.4	11.02
.675	69.5	10.78
1907.66	70.5	10.79

A and C (8.7)

1907.638	254°.78	70″.41
.673	254.50	70.61
.675	254.40	70.58
1907.66	254.56	70.53

HΣ's angle of AC requires a correction of 180°.

488. *γ Cassiopeiae.* β 1028. (2.0...11.0)

R. A. 0ʰ 49ᵐ 28ˢ Decl. + 60° 4′

A and C (13.0)

1911.663	347°.88	52″.31
.701	347.43	52.22
.720	347.85	52.44
1911.69	347.72	52.32

From the six positions on 17 n by A, Doo, and β (1879-1911) the corrected proper motion of *γ Cassiopeiae* is:

0″.026 in 97°.8

The results from meridian observations cover a wide range in direction:

Auwers	0″.027	in	134°.3
Rad (1890)	0.018	in	147.1
Newcomb	0.027	in	100.9
Boss	0.030	in	93.8

489. β 1099. (6.1...6.8)

R. A. 0ʰ 49ᵐ 34ˢ Decl. + 59° 43′

AB and C (13.5)

1910.605	155°.68	41″.20
.608	154.30	41.40
.627	155.83	41.46
1910.61	155.27	41.35

The close pair is in rapid motion. Third star for proper motion; this from meridian positions is:

Groombridge	0″.031	in	105°.0
Boss	0.026	in	90.0

497. *μ Andromedae.* H 1057. (3.9...13.0)

R. A. 0ʰ 50ᵐ 6ˢ Decl. + 37° 51′

A and C (11.5)

1909.818	122°.90	36″.46
.820	122.90	36.07
.838	123.90	36.10
1909.83	123.23	36.21

A and B (13.0)

1909.838	309°.10	40″.67
10.627	309.38	40.71
10.666	309.73	40.65
1910.38	309.40	40.68

From the measures of C, the brightest of the companions, we have for the proper motion of *μ Andromedae:*

0″.149 in 57°.8

The measures of both should be continued in this interest. Other values from the catalogues are:

Auwers (Brad.)	0″.176	in	73°.8
Newcomb (F. C.)	0.158	in	79.1
Boss	0.154	in	79.9

519. Σ 80. (7.8...8.2)

R. A. $0^h\ 53^m\ 15^s$ Decl. + 0° 8′

A and B

1907.961	320°.4	21″.74
8.000	320.1	21.75
1907.98	320.2	21.74

B and C (10.0)

1907.845	258°.10	177″.88
.865	258.02	177.98
.961	258.15	178.24
1907.89	258.09	178.03

The proper motion of A from meridian positions is given:

Glasgow	0″.193	in	229°.6
A. G. Nico.	0.127	in	225.0

The measure of B gives a much smaller value:

0″.100 in 195°.0

The third star is connected for the detection of any proper motion in B.

526. Σ 81 *rej.* (7.5...10.3)

R. A. $0^h\ 53^m\ 56^s$ Decl. — 2° 40′

1911.835	67°.6	17″.59
.870	68.3	17.49
.931	67.1	17.61
1911.88	67.7	17.56

The only other measures are recent.

528 Σ 82. (8.3...9.3)

R. A. $0^h\ 54^m\ 26^s$ Decl. + 8° 50′

A and C (10.0)

1908.843	214°.37	74″.55
.845	214.00	74.64
.884	213.25	74.99
.920	214.03	74.60
1908.87	213.91	74.69

C and D (11.0)

1908.843	196°.9	10″.86
.884	195.9	11.07
.920	197.9	10.87
1908.88	196.9	10.93

There is error in the angles given in G. C. Part I of 180° in the first, and 90° in the other. No apparent change in either.

530. Espin 45. (7.5...11.5)

R. A. $0^h\ 54^m\ 32^s$ Decl. + 48° 54′

1907.638	245°.4	7″.99
.692	244.9	8.07
.695	244.7	7.92
1907.67	245.0	7.99

The only other measures are given in G. C. Part I.

539. Ho 493. (6.5...12.5)

R. A. $0^h\ 56^m\ 4^s$ Decl. + 27° 6′

1908.845	19°.4	33″.60
.862	18.2	33.80
1908.85	18.8	33.70

Agrees in distance with my former measures. No proper motion found for the large star in the catalogues examined.

542. 39 *Andromedae.* H 1064. (6.1...12.4)

R. A. $0^h\ 56^m\ 10^s$ Decl. + 40° 42′

1909.802	3°.65	20″.30
.818	5.50	20.65
.821	4.10	20.23
1909.81	4.42	20.39

The only other measures are of recent date. The proper motion of the large star is given:

Auwers	0″.046	in	259°.9
Boss	0.024	in	245.1

545. Σ 83 *rej.* (8.0...11.0)

R. A. $0^h\ 56^m\ 30^s$ Decl. + 49° 40′

1908.559	312°.6	21″.97
.573	313.6	21.89
.597	312.9	21.90
1908.58	313.0	21.92

The prior measures are of late date.

553. 26 *Ceti.* Σ 84. (6.6...9.0)

R. A. $0^h\ 57^m\ 38^s$ Decl. + 0° 43′

A and C (13.2)

1909.838	290°.83	107″.37
.936	290.65	106.96
.953	289.89	107.38
1909.91	290.46	107.24

Distant star measured for an independent value of the common proper motion of AB. This is given:

Auwers	0″.102	in	109°.0
Boss	0.123	in	106.0
Porter	0.114	in	106.3

556. Σ 85 *rej.* (8.2...10.2)

R. A. $0^h\ 58^m\ 20^s$ Decl. — 5° 57′

A and B

1910.720	159°.4	29″.26
.760	159.8	29.21
.777	158.9	29.21
1910.75	159.4	29.23

A and C (10.8)

1910.720	116°.9	34″.15
.760	117.5	34.37
.777	117.2	34.09
1910.75	117.2	34.20

Only recent measures of this.

558. H 1065. (9.4...11.4)

R. A. $0^h\ 58^m\ 32^s$ Decl. + 27° 28′

1908.520	158°.5	23″.34
.537	158.8	23.37
.573	158.6	23.55
1908.54	158.6	23.42

This is DM (27°) 171, and not H 631 which could not be found.

560. Σ 86. (8.0...8.7)

R. A. $0^h\ 58^m\ 43^s$ Decl. — 6° 7′

A and B

1907.636	154°.8	13″.50
.657	154.2	13.50
.675	154.8	13.45
1907.66	154.6	13.48

A and C (11.0)

1907.675	37°.10	108″.56
.692	37.13	108.46
1907.68	37.11	108.51

As the components of Σ 86 are of about the same magnitude, the proper motion may be in either.

561. 72 *Piscium.* H 1068. (5.9...12.5)

R. A. $0^h\ 58^m\ 44^s$ Decl. + 14° 18′

1908.652	260°.86	55″.27
.655	260.17	54.72
.671	261.20	55.43
.673	261.62	55.29
1908.66	260.96	55.18
1911.835	260°.33	55″.26
.870	260.93	55.48
.928	260.40	55.60
.931	260.00	55.14
1911.89	260.41	55.37

From the four positions of the faint star (1877-1911) we have a fairly accurate value of the proper motion of 72 *Piscium:*

0″.081 in 24°.9

From meridian observations:

Auwers	0″.050	in	22°.4
Porter	0.050	in	344.8
Boss	0.044	in	356.2
Newcomb	0.054	in	358.9

570. ψ^1 *Piscium.* Σ 88. (4.9...5.0)

R. A. $0^h\ 59^m\ 15^s$ Decl. + 20° 50′

B and C (10.8)

1910.777	107°.32	72″.79
.780	107.46	73.14
.838	107.63	73.25
1910.80	107.47	73.06

For the common proper motion of AB. For this we have:

Auwers	0″.033	in	117°.0
Boss	0.055	in	108.2

573. σ^2 *Piscium.* S 393. (6.8...9.2)

R. A. $0^h\ 59^m\ 35^s$ Decl. + 31° 32′

A and B

1909.703	293°.98	56″.80
.706	293.83	56.41
.725	293.65	56.45
1909.71	293.82	56.55

In Part II of the *General Catalogue* the proper motion of Auwers belongs to another star. The motion is small and uncertain.

Auwers	0″.007	in	203°.2
Boss	0.020	in	165.0

About 15′ distant *sf* is *h* 86; a little brighter in the center.

h 86 and star 11.4 m

1909.703	204°.35	92″.4
.706	204.97	91.0
.725	204.55	90.7
1909.71	204.62	91.4

The only other measure is:

1885.14 208°.0 94″.5 in Eng.

h 86 is double; the other by Rosse. They point to the small star measured above:

1909.703	203°.5	35″.85
.706	203.1	35.83
1909.70	203.3	35.84

574. 77 *Piscium.* Σ 90. (5.9...6.8)

R. A. $0^h\ 59^m\ 37^s$ Decl. + 4° 16′

A and *a* (13.7)

1910.760	313°.1	31″.67
.856	313.2	31.76
.895	311.6	31.91
1910.84	312.6	31.78

A and *b* (13)

1910.760	352°.8	76″.97
.856	351.9	77.44
.895	351.5	77.09
1910.84	352.1	77.17

A and B have a common proper motion. No other measures of the faint stars:

Auwers	0″.120	in	185°.7
Porter	0.117	in	180.0
Boss	0.114	in	171.0

576. H IV 66. (6.6...10.2)

R. A. $0^h\ 59^m\ 59^s$ Decl. + 52° 51′

A and B

1907.848	75°.4	22″.13
.867	75.4	22.37
.879	75.0	22.13
1907.86	75.3	22.21

A and C (11.0)

1909.570	122°.55	198″.97
.589	122.40	198.95
.592	123.20	199.14
1909.58	122.72	199.02

From meridian observations the large star has no sensible proper motion:

Groombridge	0″.006	in	98°.9

The only other measure is:

1880.30	121°.96	199″.30	2n	Bl.

578. Σ 89 *rej.* (9.1...9.3)

R. A. $1^h\ 0^m\ 13^s$ Decl. + 79° 42′

1907.695	341°.7	15″.77
.711	341.5	15.83
.731	340.8	15.76
1907.71	341.3	15.79

Both stars in A. G. Kasan, the positions giving:

1869.5	347°.4	15″.27

DM (79°) 32, in the field closely following, is a similar pair:

1907.711	358°.4	16″.77
.731	357.0	16.08
1907.72	357.7	16.42

580. OΣ (App.) 11. (7.7...8.2)

R. A. $1^h\ 0^m\ 25^s$ Decl. + 38° 0′

1907.692	159°.50	62″.44
.695	159.75	62.14
.711	159.43	62.19
1907.70	159.56	62.26

One of these stars has a proper motion of:

0″.061 in 270° (± 180°)

Aitken has recently found the principal star to be a very close pair (= A 1516):

1907.71	334°.7	0″.16	3n	A

589. H 1070. (11.0...11.3)

R. A. $1^h\ 0^m\ 56^s$ Decl. + 61° 32′

The pair measured for H 1070 is in *h* 83 and is doubtless the one observed by Herschel, as there is nothing else near agreeing so well in angle.

1910.529	97°.4	11″.65

The largest star in *h* 83 is a 2″ pair.

605. β *Andromedae.* (2.1...14.0)

R. A. $1^h\ 3^m\ 0^s$ Decl. + 34° 59′

A and C (12.5)

1909.531	270°.55	89″.93
.570	270.52	90.69
.589	270.64	89.71
1909.56	270.57	90.11

A and D (11.7)

1909.531	142°.05	85″.52
.570	142.33	85.26
.573	142.52	85.94
1909.56	142.30	85.57

A and E (10.9)

1909.531	304°.75	132″.27
.570	304.85	132.83
.589	304.38	133.10
1909.56	304.66	132.73

A and F (11.0)

1909.570	85°.92	155″.14
.573	85.98	154.82
.589	86.15	155.27
1909.58	86.02	155.08

Rejecting AF because the early position is from a single night, we have from the other stars for the proper motion of A:

AC	R. A. + 0″.172	Decl. — 0″.085
AD	0.170	0.084
AE	0.177	0.137
	+ 0.173	— 0.102

Therefore the corrected proper motion of β *Andromedae* is:

0″.201 in 120°.5

This is given from meridian positions:

Auwers (corr'd)	0″.199	in	121°.8
Newcomb (Stand.)	0.223	in	123.2
Newcomb (Fund.)	0.216	in	122.8
Boss	0.216	in	122.2

About 14^s *p* and 5′ *n* is *h* 89 which has a good central condensation.

h 89 and star 12.5 m

1909.531	12°.60	75″.64
.570	12.75	74.52
.589	13.25	75.21
1909.56	12.87	75.12

An earlier position is:

1880.52	14°.0	75″.3	2n	Wn.

609. OΣ 23. (7.5...8.0)

R. A. $1^h\ 3^m\ 2^s$ Decl. + 51° 6′

A and B

1909.818	191°.7	14″.60
.821	191.6	14.53
.838	190.8	14.61
1909.83	191.4	14.58

One of the proper motions from A. G. Harv., given in Part II of the *General Catalogue* is manifestly wrong, since there is no relative change in the last fifty years. I have therefore measured a third star for verification of the proper motion, if any, in AB.

A and C (12.0)

1909.818	93°.93	49″.89
.821	94.00	50.57
.838	94.58	49.70
1909.83	94.17	50.05

626. H 634. (6.5...11.0)

R. A. $1^h\ 4^m\ 36^s$ Decl. + 8° 55′

1909.936	260°.23	39″.13
10.570	260.23	39.17
10.586	260.20	39.25
1910.36	260.22	39.18
1912.583	260°.03	39″.17
.622	259.64	39.34
.638	258.90	39.26
1912.61	259.52	39.26

From the measures of the faint star (1879-1912) the proper motion of A is:

Measures	0″.233	in	23°.6
Porter	0.258	in	17.7

638. H 2026. (8.6...11.0)

R. A. $1^h\ 5^m\ 42^s$ Decl. + 4° 15′

A and B

1910.838	305°.6	10″.12
.856	305.0	10.55
1910.85	305.3	10.33

A and C (9.0)

1910.838	58°.08	231″.39
.856	57.80	231.16
.893	57.88	231.24
1910.86	57.92	231.26

It is now certain that A and B are moving together, and the large change in C is due to that movement. (See G. C. Part II, pp. 294, 1058.)

644. OΣ 26. (6.2...10.0)

R. A. $1^h\ 6^m\ 23^s$ Decl. + 29° 26′

There is no star in the Madler place. I have measured one of several small stars in the field.

A and C (12.0)

1910.856	341°.70	114″.31
.895	341.45	113.47
1910.87	341.57	113.89

The star referred to by Madler is undoubtedly C of OΣ 30.

647. *φ Piscium.* Σ 99. (4.7...10.1)

R. A. $1^h\ 7^m\ 14^s$ Decl. + 23° 57′

A and C (13.0)

1912.638	172°.67	143″.78
.675	173.15	144.00
.678	172.65	144.31
1912.66	172.82	144.03

No material change in AB since 1832. The proper motion of *φ Piscium* is uncertain from the catalogue positions:

Auwers	0″.018	in	180°.0
Boss	0.046	in	151.9

649. H 2028. (6.5...7.2)

R. A. $1^h\ 7^m\ 36^s$ Decl. + 73° 23′

A and B

1908.709	203°.80	61″.38
.711	203.97	61.10
.728	203.75	61.05
1908.71	203.84	61.18

The proper motions of these two stars, Groombridge 267 and 266, are given in the Greenwich Catalogue for 1890:

A	0″.037	in	104°.0
B	0.032	in	121.8

There has been no relative change, and therefore the proper motions must be exactly the same. For a better determination of this motion hereafter, I have measured a third star:

B and C (12.2)

1908.709	210°.60	47″.08
.711	209.47	47.20
.728	210.68	46.21
1908.71	210.25	46.83

652. OΣ 28. (7.0...8.5)

R. A. $1^h\ 7^m\ 53^s$ Decl. + 80° 13′

A and B

1908.728	306°.9	0″.92
.731	306.3	0.67
.750	302.5	0.85
1908.74	305.2	0.81

AB and C (7.0)

1908.709	25°.85	130″.20
.711	25.60	130.36
.728	25.82	130.11
1908.72	25.76	130.22

C and D (11.0)

1908.709	156°.60	66″.48
.711	155.83	66.55
.728	155.75	66.60
1908.72	156.06	66.54

In the measures by Dembowski, C is treated as the primary. As printed in Part I of the *General Catalogue* it is therefore 180° in error.

The measures of C do not indicate any material change, and therefore if the proper motion given in Part II is correct, the three stars have the same movement. To settle this hereafter, I have measured a fourth star.

658. H 2030. (9.0...12.5)

R. A. $1^h\ 9^m\ 31^s$ Decl. + 53° 7′

A and B

1908.728	48°.0	24″.12
.750	48.9	24.02
.766	49.2	23.98
1908.75	48.7	24.04

A and C (9.2)

1908.728	193°.2	38″.66
.750	193.2	38.62
.766	193.6	38.69
1908.75	193.3	38.66

A and C are respectively DM (52°) 297 and (53°) 266; and the R. A. should be as given here. The only other measures are those given in the *General Catalogue*.

672. Σ 102. (7.0...8.2)

R. A. $1^h\ 10^m\ 40^s$ Decl. + 48° 23′

AB and C (8.4)

1908.709	225°.5	10″.15
.711	224.2	10.20
.728	223.7	10.10
1908.71	224.5	10.15

AB and D (10.8)

1908.709	62°.85	27″.03
.711	63.07	27.03
.728	62.48	27.16
1908.71	62.80	27.07

The components of the triple, A, B and C have a common proper motion. This, from the measures of D (1832-1908), is:

0″.045 in 100°.6

All the other measures of the three principal stars are given in G. C. Part II.

For greater certainty I have connected another faint star:

D and E

1908.709	355°.72	97″.96
.711	355.37	97.52
.728	355.02	98.02
1908.71	355.37	97.83

E and *e* (11.1...13.0)

1908.728	54°.7	10″.17
.750	53.0	10.30
1908.74	53.8	10.23

673. H 1077. (8.1...10.9)

R. A. $1^h\ 10^m\ 42^s$ Decl. + 44° 0′

1908.711	294°.8	38″.77
.750	294.7	38.60
.766	294.7	38.30
1908.74	294.7	38.56

No other measures.

686. Hd 47

The pair measured for this is evidently Hd 48 (No. 694). Fox finds no other.

690. H 5453. (8.0...10.1)

R. A. $1^h\ 12^m\ 29^s$ Decl. — 1° 29′

A and B

1907.540	208°.8	27″.74
.636	208.9	27.44
.638	208.9	27.72
.845	208.8	27.48
1907.66	208.85	27.60

A and C (12.2)

1907.845	27°.08	242″.36
8.000	27.32	243.00
1907.92	27.20	242.68

It is now certain that A and B have the same large proper motion. The third star is connected for an independent value of this motion hereafter.

Porter	0″.499	in	121°.4
A. G. Nico.	0.447	in	115.1

691. *φ Cassiopeiae.* H III. 23. (5.2...12.3)

R. A. $1^h\ 12^m\ 32^s$ Decl. + 57° 36′

A and D (10.6)

1909.458	287°.22	179″.08
.493	287.37	179.00
.496	287.40	179.07
1909.48	287.33	179.05

The only other measure is:

1880.40	287°.44	179″.01	2n	Bl.

Evidently the large star has no sensible proper motion. It is on the border of the cluster *h* 97.

Auwers	0″.010	in	204°.1
Boss	0.011	in	62.5

697. *35 Cassiopeiae.* S 397. (6.6...8.5)

R. A. $1^h\ 13^m\ 4^s$ Decl. + 64° 2′

1909.589	347°.30	53″.47
.592	347.14	53.32
.649	347.45	53.46
1909.61	347.30	53.42

Possibly a little change in the angle. The proper motion is small:

Auwers	0″.069	in	134°.9
Groombridge	0.062	in	106.0
Boss	0.061	in	103.4

706. Σ 112. (8.5...9.0)

R. A. $1^h\ 13^m\ 40^s$ Decl. + 45° 42′

A and B

1912.507	331°.6	21″.42
.562	331.3	21.82
.564	330.6	21.56
1912.54	331.2	21.60

One of these stars has a proper motion of 0″.032 in 291°.4 (± 180°). Later measures of the very faint star, C, will show whether B has any movement.

710. A. G. 16. (8.6...9.7)

R. A. $1^h\ 13^m\ 54^s$ Decl. + 13° 8′

1906.796	190°.2	30″.83
.964	190.7	30.75
1906.88	190.4	30.79

Probably fixed.

712. A. G. 17. (8.5...10.0)

R. A. $1^h\ 14^m\ 29^s$ Decl. + 10° 50′

1906.796	98°.3	54″.56
.964	98.7	54.61
1906.88	98.5	54.58

718. Σ 115. (7.3...7.5)

R. A. $1^h\ 15^m\ 42^s$ Decl. + 57° 31′

AB and C (12.8)

1909.458	278°.9	44″.85
.493	279.0	44.28
.496	278.4	44.71
1909.48	278.8	44.61

AB and D (10.5)

1909.458	182°.58	248″.23
.493	182.70	248.19
.496	182.57	247.92
1909.48	182.62	248.11

The only earlier measure is:

1880.63	181°.68	250″.06	in	Bl.

No other measures of C. From the measures of D we have for the proper motion of AB:

Measures	0″.156	in	117°.8
Porter	0.172	in	138.6
A. G. Hels.	0.199	in	131.2

724. OΣ (App.) 16. (6.5...9.1)

R. A. $1^h\ 16^m\ 18^s$ Decl. + 16° 34′

1907.750	137°.93	64″.93
.772	138.18	64.91
.788	137.95	64.87
1907.77	138.02	64.90

Comparing this with the position by Dembowski in 1875, we have for the proper motion of the large star:

0″.048 in 305°.9

732. *ψ Cassiopeiae.* β 1101. (4.5...13.5)

R. A. $1^h\ 17^m\ 27^s$ Decl. + 67° 30′

A and C (8.9)

1911.622	109°.8	26″.47
.625	109.3	26.54
.644	109.9	26.64
.663	110.1	26.62
1911.64	109.8	26.57

From the six positions on 24 n by Σ, Δ and β (1831-1911) we have an independent value of the proper motion of *ψ Cassiopeiae:*

0″.087 in 69.2

From meridian observations it is given:

Auwers	0″.067	in	70°.8
Boss	0.086	in	66.8
Newcomb	0.076	in	66.1

734. OΣ (App.) 117. (7.5...9.0)

R. A. $1^h\ 17^m\ 37^s$ Decl. + 38° 24′

A and B

1911.622	102°.83	36″.79
.625	102.37	37.56
.644	102.36	37.22
1911.63	102.53	37.19

A and C (8.0)

1911.622	338°.60	144″.02
.625	338.65	144.23
.644	339.05	144.00
1911.63	338.77	144.08

C and D (9.0)

1911.622	289°.67	54″.54
.625	289.73	54.65
.644	289.93	54.69
1911.63	289.78	54.63

As at least three of these stars have some proper motion, I have connected a faint star to show hereafter the distribution of motion in the large stars.

C and E (12.8)

1911.644	28°.40	85″.41
.663	28.21	85.85
.775	27.90	85.93
1911.69	28.17	85.73

737. H 13

R. A. $1^h\ 17^m\ 52^s$ Decl. + 12° 17′

H 13 and *h* 112

1910.666	273°.9	114″.2

The nebula in the field is very faint and diffused, and the bisection not very exact. The double star was measured in 1902. The components are distant companions to DM (12°) 172.

740. 44 *Ceti*. H 1079. (6.9...10.7)

R. A. $1^h\ 18^m\ 0^s$ Decl. — 8° 38′

1907.692	298°.37	81″.87
.695	298.33	81.40
.731	298.50	81.30
1907.71	298.40	81.52

It is safe to assume that the 10.7 m star is fixed, and all the motion in the other. My measures (1877-1907) give for the proper motion of 44 *Ceti:*

0″.180 in 101°.3

It is given from meridian positions:

Auwers	0″.148	in	125°.0
Rad. (1890)	0.134	in	115.4
Boss	0.172	in	112.9

741. *θ Ceti*. β 505. (3.7...13.7)

R. A. $1^h\ 18^m\ 1^s$ Decl. — 8° 48′

1910.933	56°.78	62″.18
10.971	57.23	63.22
11.564	57.30	62.88
11.583	57.58	62.34
1911.26	57.22	62.65

The four β positions (1877-1911) give for the proper motion of *θ Ceti:*

0″.150 in 197°.3

Or, omitting the measure of 1877, which is on a single night:

0″.186 in 191°.4

This motion from meridian observations seems to be too large:

Auwers	0″.233	in	206°.0
Boss	0.227	in	200.6
Newcomb	0.231	in	201.5

747. OΣ 30. (7.8...11.4)

R. A. $1^h\ 18^m\ 50^s$ Decl. + 30° 55′

A and B

1907.750	238°.0	4″.58
.788	239.2	4.43
1907.77	238.6	4.50

A and C (7.5)

1907.750	105°.30	56″.81
.772	105.30	56.46
.788	105.00	56.82
1907.77	105.20	56.70

A and *a* (13.6)

1907.750	162°.0	25″.91
.772	159.7	25.92
.788	163.1	26.49
1907.77	161.6	26.11

No change in B and C. No other measures of the small star.

748. Hd 50. (8.5...12.1)

R. A. $1^h\ 18^m\ 53^s$ Decl. + 2° 25′

1910.570	264°.9	32″.22
.586	264.3	32.83
.666	264.4	32.38
1910.61	264.5	32.48

No other measures of this. About 45′ distant, nearly *n* is *h* 116; a little brighter in the middle, and much elongated in 136°.4.

h 116 and star 12.8 m

1910.666	227°.7	221″.3

753. Σ 121. (8.7...9.7)

R. A. $1^h\ 19^m\ 29^s$ Decl. + 63° 51′

1909.589	274°.9	13″.05
.592	275.4	13.09
.649	274.9	12.77
1909.61	275.1	12.97

Probably a little change.

758. ω *Andromedae.* β 999. (5.3...12.0)

R. A. 1^h 20^m 29^s Decl. + 44° 47′

A and B

1908.711	97°.7	2″.57
.728	100.7	2.48
.882	99.9	2.57
1908.77	99.4	2.54

A and C (10.7)

1908.652	110°.35	124″.93
.673	110.60	124.96
.689	110.20	124.63
1908.67	110.38	124.84

I have given in Part II of the *General Catalogue* the proper motion of ω *Andromedae* from the measures of AC to 1902:

0″.359 in 106°.2

Some of the meridian values are:

Bonn	0″.347	in	107°.1
Bossert	0.355	in	106.3
Boss	0.358	in	105.6

762. Σ 123 *rej.* (9...9)

R. A. 1^h 20^m 53^s Decl. + 52° 51′

A and B

1907.559	161°.6	16″.50
.562	162.4	16.25
.578	161.4	16.58
1907.57	161.8	16.44

B and C

1907.559	186°.9	38″.58
.562	187.4	38.78
.578	187.2	38.43
1907.57	187.2	38.60

C and D (10.5...11.2)

1907.559	72°.8	10″.26
.578	74.8	10.28
1907.57	73.8	10.27

The only other measures are of recent date.

765. 95 *Piscium.* β 1164. (6.7...7.0)

R. A. 1^h 21^m 26^s Decl. + 4° 44′

AB and C (11.4)

1910.838	221°.43	148″.35
.856	220.87	148.41
.895	221.22	148.18
1910.86	221.17	148.31

For the proper motion of AB.

Porter	0″.155	in	202°.7
Boss	0.162	in	193.2
Auwers	0.154	in	204.0

769. A. G. 18. (8.6...10.0)

R. A. 1^h 21^m 55^s Decl. + 13° 51′

1906.796	41°.1	73″.90
.906	41.3	74.16
.964	41.4	74.15
1906.89	41.3	74.07

No motion.

778. 48 *Ceti.* See 14. (5.2...12.8)

R. A. 1^h 23^m 51^s Decl. — 22° 15′

1907.675	249°.2	21″.99
10.627	249.6	21.99
1909.15	249.4	21.99

The proper motion of 48 *Ceti* is given:

Auwers	0″.026	in	113°.1
Boss	0.056	in	87.9

792. Σ 131. (6.0...9.2)

R. A. 1^h 25^m 17^s Decl. + 60° 4′

A and B

1910.818	141°.8	13″.92
.838	142.6	13.72
.856	143.0	13.92
1910.84	142.5	13.85

A and C (9.6)

1910.818	144°.5	28″.08
.838	145.1	28.15
.856	145.0	28.39
1910.84	144.9	28.21

The object referred to by Herschel is *h* 126 (= M 103); most of the stars 10 m to 12 m. The 7 m star in the middle is red. No other measures of C.

794. Σ 132. (7.0...10.0)

R. A. 1^h 25^m 35^s Decl. + 16° 20′

A and *a* (14.2)

1908.750	154°.1	14″.41
.788	153.3	14.05
.824	154.7	13.99
1908.79	154.0	14.15

A and C (11.1)

1908.652	228°.90	68″.75
.655	228.95	68.77
.673	229.13	68.56
1908.66	228.99	68.69

A and D

1908.652	113°.03	135″.61
.655	113.17	135.72
.673	113.35	134.98
1908.66	113.18	135.44

D and *d* (10.1...10.7)

1908.652	287°.7	5″.47
.655	288.0	5.89
.673	288.2	5.39
1908.66	288.0	5.58

The only prior measures of these stars are the following:

AC	1888.14	225°.72	68″.86	in	Eng.
AD	1888.14	114.15	140.23	in	Eng.

These positions unfortunately depend upon a single observation. Comparing them with the recent measures, we have for the proper motion of A:

AC	R. A. + 0″.123	Decl. — 0″.146
AD	0.168	0.197
	+ 0.145	— 0.171

Further measures of these stars will decrease the error probable in the result given here.

Measures	0″.224	in	139°.7
Auwers	0.248	in	157.8
Porter	0.238	in	154.6

A comparison of the present position of the faint star *a* with the rough setting of 1904 tends to show that it is not moving in space with the other.

795. A. G. 20. (9.1...9.3)

R. A. $1^h\ 25^m\ 43^s$ Decl. + 11° 40′

1906.964	248°.9	2″.38
7.540	247.5	2.65
1907.25	248.2	2.51

The smaller component is preceding.

798. Σ 133. (7.0...10.5)

R. A. $1^h\ 25^m\ 55^s$ Decl. + 35° 14′

A and C (10.8)

1910.971	195°.8	24″.62
11.545	196.1	24.57
11.564	195.8	24.81
1911.36	195.9	24.67

A and D (10.8)

1911.545	191°.7	29″.27
.564	191.3	29.35
.583	190.8	29.34
1911.56	191.3	29.32

From the measures of the distant small stars by Σ, Δ, Hl and β (1833-1911) we have for the proper motion of AB:

AC	R. A. — 0″.037	Decl. — 0″.047
AD	0.036	0.043

Therefore the proper motion of the principal star is:

0″.058 in 219°.1

806. Σ 135. (8.0...10.7)

R. A. $1^h\ 27^m\ 18^s$ Decl. + 35° 34′

A and B

1907.692	259°.6	8″.12
.711	259.5	8.00
.730	259.7	7.96
1907.71	259.6	8.03

A and C (10.5)

1907.692	52°.00	53″.94
.711	52.53	53.95
.730	53.03	53.98
1907.71	52.52	53.96

Dembowski gives AC:

1867.68	52°.6	56″.8

This appears to be a single rough setting, and therefore change is improbable. No change in AB.

811. Howe 5. (8.5...8.7)

R. A. $1^h\ 27^m\ 55^s$ Decl. — 12° 29′

1908.826	32°.5	13″.32
9.703	32.2	13.24
9.785	32.8	13.28
1909.44	32.5	13.28

Without change. Identified as SD (12°) 288, the place of which is given here.

813. 100 *Piscium*. Σ 136. (6.9...8.0)

R. A. $1^h\ 28^m\ 29^s$ Decl. + 11° 57′

A and C (12.9)

1911.835	310°.65	74″.87
.870	310.90	75.05
1911.85	310.77	74.96

A and D (11.1)

1911.777	8°.40	124″.26
.813	8.40	124.46
.870	8.37	123.71
1911.82	8.39	124.14

A and B are relatively fixed. As the proper motion of 100 *Piscium* is very uncertain from meridian observations, I have connected two faint stars.

Auwers	0″.046	in	273°.8
Boss	0.011	in	188.0

825. β 1000. (7.6...8.5)

R. A. $1^h 29^m 27^s$ Decl. — 30° 32′

A and C (8.5)

1908.692	20°.45	140″.79
10.971	20.30	140.06
1909.83	20.37	140.42

The comparison star may have some proper motion. The other positions, and the apparent motion of A, are given in Part II of the *General Catalogue.*

826. OΣ 33. (7.2...8.3)

R. A. $1^h 29^m 31^s$ Decl. + 58° 1′

1907.695	75°.7	25″.29
.711	75.8	25.14
.714	75.5	25.25
1907.71	75.7	25.23

Very little, if any, change.

830. Σ 138. (7.3...7.3)

R. A. $1^h 29^m 46^s$ Decl. + 7° 2′

A and C (15.5)

1910.627	66°.3	24″.41
.678	66.8	23.87
.760	67.1	24.67
1910.69	66.7	24.32

Change in distance possible, but the small star is very faint.

839. OΣ (App.) 20. (7.5...8.5)

R. A. $1^h 31^m 3^s$ Decl. + 21° 57′

A and B

1910.950	314°.00	94″.17
.971	314.30	94.14
1910.96	314.15	94.16

From the four positions of these stars (1875-1910), one of them has a proper motion of 0″.058 in 286°.6 (± 180°); further measures of the faint star will show which one it is.

A and *a* (12.9)

1910.971	256°.7	27″.08

843. Σ 139. (8.8...9.0)

R. A. $1^h 31^m 44^s$ Decl. + 52° 21′

A and B

1908.518	223°.5	9″.83
.556	222.1	9.90
.559	223.1	10.02
1908.54	222.9	9.92

No change since Dembowski. Two faint stars closely preceding AB.

A and C (9.4)

1908.518	87°.45	107″.63
.556	88.07	107.16
.559	87.87	107.14
1908.54	87.80	107.31

The only other observation of this is:

1881.46	87°.97	106″.89	3n	Bl

The difference is probably due to errors of observation.

845. Σ 140. (8.5...9.2)

R. A. $1^h 31^m 56^s$ Decl. + 40° 27′

A and C (11.4)

1909.458	319°.42	191″.86
.493	319.60	191.97
.512	319.63	191.67
1909.49	319.55	191.83

No change in AB. The only other measure of C is:

1880.63	319°.63	190″.25	1n	Bl.

As this is on a single night, the apparent change in distance may not be real.

854. 103 *Piscium.* β 5. (7.0...9.0)

R. A. $1^h 32^m 47^s$ Decl. + 16° 1′

AB and C (11.8)

1910.856	185°.53	90″.33
.895	185.12	90.74
.931	185.83	90.49
1910.89	185.49	90.52

For the proper motion of A.

Auwers	0″.040	in	228°.3
Boss	0.031	in	185.3

860. Σ 142. (8.2...8.4)

R. A. $1^h 33^m 28^s$ Decl. + 14° 39′

A and B

1907.540	348°.9	14″.10
.636	349.1	14.12
.673	349.5	14.04
1907.62	349.2	14.09

A and C (10.4)

1907.540	181°.95	102″.54
.636	182.22	102.33
.673	181.70	102.49
1907.62	181.96	102.45

I have shown that one of the Struve components has a proper motion of 0″.225 in 101°.0 (± 180°). As they are of nearly the same magnitude, it is as likely to be in one as the other. I have therefore connected a third star, a remeasurement of which after a few years will show at once which one of the larger stars is in motion.

The following later measures appear to indicate that the proper motion is in B:

1911.625	182°.00	102″.21
.644	182.30	102.18
.663	181.51	102.55
1911.64	181.94	102.31

861. τ *Andromedae.* (5.0...10.2)

R. A. 1^h 33^m 30^s Decl. + 39° 58′

1910.684	328°.63	52″.85
.703	328.32	52.55
.720	328.83	52.85
1910.70	328.59	52.75

The proper motion, if any, is very small, There is a misprint in the angle in G. C. Part II.

Boss	0″.029	in	151°.1
Auwers	0.019	in	142.3
Newcomb	0.040	in	136.8

865. H 2066. (10.8...11.0)

R. A. 1^h 34^m 6^s Decl. + 55° 11′

1910.586	67°.5	19″.42
.608	67.4	19.58
1910.60	67.4	19.50

No other measures. *h* 146 is about 15′ distant *nf* H 2066; the principal star of this cluster is OΣ 35.

868. H 1088. (7.0...9.5)

R. A. 1^h 34^m 20^s Decl. + 58° 1′

1911.622	167°.7	19″.58
.644	167.9	19.59
.663	168.8	19.71
1911.64	168.1	19.63

Further measures are needed for the correction of the proper motion of A (Bradley 222).

Auwers	0″.080	in	104°.5
Bossert	0.090	in	102.9

870. Σ 145. (6.0...10.6)

R. A. 1^h 34^m 36^s Decl. + 25° 8′

A and B

1910.684	33°.3	10″.78
.703	32.3	10.53
.720	32.5	10.78
1910.70	32.7	10.70

As these stars appear to have a common proper motion, I have connected a third star:

A and C (10.8)

1910.703	340°.13	79″.22
.720	340.37	78.94
1910.71	340.25	79.08

The motion of A is given:

Boss	0″.135	in	108°.6
A. G. Ber.	0.130	in	97.9

871. Σ 146. (8.3...8.3)

R. A. 1^h 34^m 57^s. Decl. + 9° 30′

1909.782	126°.4	24″.02
.802	126.5	23.90
.838	126.4	24.02
1909.81	126.4	23.98

No change.

872. 44 *Cassiopeiae.* β 1103. (6.2...12.5)

R. A. 1^h 35^m 13^s Decl. + 59° 57′

A and C (10.0)

1912.545	309°.50	66″.03
.562	310.25	65.90
.564	309.87	66.04
1912.56	309.87	65.99

A and D (9.6)

1912.545	228°.67	140″.34
.562	228.92	140.11
.564	228.90	140.08
1912.56	228.83	140.15

No other measures of these stars. The proper motion of 44 *Cassiopeiae* is given in the catalogues:

Auwers	0″.063	in	103°.0
Groombridge	0.041	in	152.2
Boss	0.027	in	118.5

The 7.0 m star, Piazzi I. 139 (=DM (59°) 306), 42^s preceding 44 *Cassiopeiae,* has two small companions:

A and B (13.8)

1912.545	100°.8	12″.85
.562	101.3	12.80
.564	102.0	12.64
1912.56	101.4	12.66

A and C (13.5)

1912.545	12°.6	26″.56
.562	12.6	26.60
.564	11.9	26.81
1912.56	12.4	26.66

No other measures. The proper motion of the large star is doubtful:

Groombridge	0″.026	in	218°.6
Boss	0.008	in	156.9

875. H 2072. (8.0...9.0)

R. A. 1ʰ 35ᵐ 45ˢ Decl. — 18° 37′

1911.755	283°.9	3″.02
.775	283.8	3.22
.813	286.0	3.13
1911.78	284.6	3.12

Probably unchanged.

878. H 2069. (9.2...9.3)

R. A. 1ʰ 35ᵐ 49ˢ Decl. + 52° 41′

The *Astrographic Catalogue* gives a smaller distance:

1903.76 242°.7 18″.85 Catania.

882. 107 *Piscium.* H 2071. (5.5...12.2)

R. A. 1ʰ 35ᵐ 58ˢ Decl. + 19° 41′

A and B

1910.703	249°.5	19″.09
.742	247.5	19.00
.760	248.1	18.92
1910.73	248.4	19.00

A and C (10.5)

1910.684	350°.15	95″.84
.703	350.02	95.89
.742	350.20	95.42
1910.71	350.12	95.72

The proper motion of 107 *Piscium* from the measures of AB is:

0″.745 in 201°.4

This of course should be identical, as practically it is, with the value found from AC, and given in G. C. Part II.

Measures of AC	0″.739	in	205°.0
Porter	0.733	in	203.9
Boss	0.735	in	203.8

884. OΣ 35. (6.8...10.0)

R. A. 1ʰ 36ᵐ 0ˢ Decl. + 55° 16′

1909.589	103°.4	11″.28
.647	101.9	11.13
.666	103.5	11.31
1909.63	102.9	11.24

The A. G. Harvard proper motion of 0″.065 in 170°.9 of the large star cannot be correct. Rejecting measures made on less than 3n, the five positions by OΣ, Δ, Hu and β (1847-1909) give for the motion of A:

0″.042 in 232°.4

925. Σ 156. (8.3...8.8)

R. A. 1ʰ 39ᵐ 50ˢ Decl. + 59° 46′

1907.562	97°.8	5″.54
.581	98.1	5.70
.638	97.6	6.09
1907.59	97.8	5.78

Change uncertain.

934. Σ 159 *rej.* (8.9...11.0)

R. A. 1ʰ 40ᵐ 54ˢ Decl. + 16° 46′

1906.772	293°.9	28″.80
.813	294.6	28.40
.906	294.2	28.27
1906.83	294.2	28.49

No other measures.

941. Σ 162. (7.0...7.5)

R. A. 1ʰ 41ᵐ 48ˢ Decl. + 47° 18′

A and D (9.7)

1908.518	95°.88	135″.63
.559	95.77	135.23
.573	95.73	135.62
1908.55	95.79	135.49

D is DM (47°) 509. The only other measure is:

1881.46 95°.40 133″.96 3n Bl

As the separate distances differ by more than 1″, it would be unsafe to infer any real change.

944. H 2085

R. A. 1ʰ 41ᵐ 56ˢ Decl. + 52° 12′

There is an error in printing the angle of the small pair *nf* H 2085 as given in G. C. Part II; for 274°.0 read 264°.0.

951. Σ 163. (6.2...9.7)

R. A. 1ʰ 42ᵐ 35ˢ Decl. + 64° 16′

A and C (9.7)

1908.518	254°.28	114″.65
.556	254.54	115.01
.559	254.60	114.70
1908.54	254.47	114.79

The only prior position is:

1879.40 254°.25 114″.79 2n Bl

No proper motion found in the catalogues for the large star

953. Σ 171. (8.2...8.6)

R. A. 1ʰ 42ᵐ 40ˢ Decl. — 2° 1′

A and B

1910.931	161°.8	30″.59
.933	160.8	30.63
.971	160.9	30.87
1910.94	161.2	30.70

One of these stars, probably the larger, has a small proper motion. The measures of AB (1829-1910) give for the apparent motion of A:

0″.046 in 2°.4

There is no sensible change in BC (β 511).

960. Σ 167 *rej.* (8.7...9.9)

R. A. 1ʰ 43ᵐ 12ˢ Decl. + 65° 51′

1911.545	9°.1	15″.80
.564	9.4	15.64
.583	8.9	15.81
1911.56	9.1	15.75

The change in position-angle seems to confirm the proper motion given to A in G. C. Part II. The only other measures are my own in 1903.

Schroeter 0″.325 in 106°.5

974. Σ 175. (8.2...8.5)

R. A. 1ʰ 44ᵐ 25ˢ Decl. + 20° 31′

A and B

1909.818	348°.2	17″.57
.821	348.7	17.51
.838	348.4	17.44
1909.83	348.4	17.51

B and C (12.5)

1909.802	37°.30	170″.91
.838	37.55	171.13
1909.82	37.42	171.02

Third star measured to determine which of the nearly equal components has the proper motion. The apparent motion of A from the measures of AB (1830-1909) is:

0″.108 in 196°.0

990. β 259. (8.7...11.2)

R. A. 1ʰ 46ᵐ 20ˢ Decl. — 10° 19′

1909.649	236°.8	4″.63
.703	236.1	4.58
.780	237.3	4.85
1909.71	236.7	4.69

No material change.

Following 72″.4 and 91″.4 *n* is *h* 160 (= *h* 2442); faint and diffused; elongated in 50°.

997. Σ 181 *rej.* (8.5...9.1)

R. A. 1ʰ 47ᵐ 32ˢ Decl. + 37° 36′

A and B

1907.542	125°.6	26″.98
.562	124.7	26.87
.581	124.9	27.10
1907.56	125.1	26.98

B and C (11.0)

1907.542	81°.1	26″.16
.562	79.3	26.70
.581	80.7	26.08
1907.56	80.4	26.31

The angles by Miller are 180° in error. There is a 12 m star from A, 279° : 25″.

1008. 56 *Andromedae.* Σ 4, App. I. (6.0...6.0)

R. A. 1ʰ 49ᵐ 1ˢ Decl. + 36° 40′

A and *a* (11.4)

1909.496	77°.8	18″.01
.512	78.2	18.27
.515	79.2	18.41
1909.51	78.4	18.23

B and *b* (9.2)

1909.496	257°.40	203″.64
.512	257.73	203.77
.515	257.57	204.09
1909.51	257.57	203.83

The 9.2 m star measured from B is DM (36°) 349. The measures of this tend to show that B has no proper motion, and that the change in AB is wholly due to the proper motion of the principal star. The observations should be continued.

1880.30 257°.55 203″.73 2n Bl.

For the proper motion of 56 *Andromedae* we have:

Auwers	0″.162	in	83°.3
Porter	0.157	in	83.0
Boss	0.181	in	86.5

The proper motion of B is given:

Auwers	0″.057	in	275°.0
Porter	0.025	in	276.8
Boss	0.005	in	309.8

1014. A. G. 26. (8.8...11.0)

R. A. 1ʰ 49ᵐ 37ˢ Decl. + 14° 31′

1906.964	310°.0	31″.16
7.022	310.5	31.27
7.540	309.8	30.95
1907.18	310.1	31.13
1911.835	308°.6	31″.36
.870	309.4	31.50
.928	309.7	31.28
1911.88	309.2	31.38

The distance may be increasing if the measure of 1895 is correct.

1015. (9.2...9.5)

R. A. $1^h 49^m 41^s$ Decl. + 1° 15′

This is the new pair referred to in the note to Σ 186. As the measures show no sensible motion, it can not be the pair measured by Hall, unless there is a large error in his position-angle.

1906.964	31°.7	0″.77
7.675	34.9	0.74
7.750	30.5	0.91
1907.46	32.4	0.81

The following is of Σ 186:

1907.675 32°.2 0″.63

1018. A. G. 27. (9.3...10.7)

R. A. $1^h 50^m 31^s$ Decl. + 14° 30′

1906.964	263°.0	17″.62
7.022	262.8	17.52
7.540	263.2	17.85
1907.18	263.0	17.66
1911.813	264.7	17.54
.835	264.2	17.38
.870	264.2	17.51
1911.84	264.4	17.48

Change is still uncertain.

1020. H 1098. (10...12)

R. A. $1^h 50^m 33^s$ Decl. + 59° 35′

1909.438	343°.6	16″.72
.515	343.1	16.41
.570	344.9	17.03
1909.51	343.9	16.72

H 1098 is one of the principal stars of *h* 170. No other measures.

1023. H 1100. (6.3...10.6)

R. A. $1^h 50^m 47^s$ Decl. + 64° 2′

1910.684	310°.40	39″.33
.703	310.60	38.78
.739	310.47	39.34
1910.71	310.49	39.15

The time interval is too short to show whether or not there is common proper motion.

The motion of A is given:

Boss	0″.049	in	100°.7
Batterman	0.031	in	117.0

1025. S 404. (7.6...8.6)

R. A. $1^h 50^m 49^s$ Decl. + 40° 48′

A and B

1912.262	77°.55	24″.83
.564	76.23	24.22
.583	76.55	24.52
1912.57	76.78	24.52

B and C (12.9)

1912.564	99°.7	81″.98
.622	100.8	81.21
1912.59	100.2	81.59

The measures of AB (1879-1912) give the apparent motion of the larger star:

0″.052 in 298°.5

I have connected a faint star to show whether or not there is any change in B. No proper motion found of either in the star catalogues.

1036. *48 Cassiopeiae.* β 513. (5.0...7.5)

R. A. $1^h 52^m 7^s$ Decl. + 70° 19′

A and C (13.6)

1911.775	52°.0	23″.74
.777	52.4	23.36
.813	52.3	23.66
1911.78	52.2	23.59

As the first measure of the faint star is on a single night, other observations of C are required for a good value of the proper motion of AB. This is given from the meridian places:

Auwers	0″.069	in	264°.2
Boss	0.061	in	275.6

1037. Σ 192. (8.2...9.0)

R. A. $1^h 52^m 23^s$ Decl. + 57° 57′

A and C (9.0)

1908.518	145°.82	76″.02
.556	146.12	76.10
.559	145.94	75.85
1908.54	145.96	75.99

C is DM (57°) 448. The only measure is:

1881.46 145°.47 77″.15 3n Bl

There is an apparent change in the distance.

1044. *47 Cassiopeiae.* Sh 22. (5.5...9.5)

R. A. $1^h 53^m 6^s$ Decl. + 76° 42′

1912.408	198°.25	95″.42
.427	198.33	95.32
.430	198.67	95.16
1912.42	198.42	95.30

From the β measures (1881-1912) the proper motion of 47 *Cassiopeiae* is:

0″.128 in 105°.9

From meridian observations we have:

Auwers	0″.125	in	114°.6
Boss	0.143	in	112.2

1048. Σ 198 *rej.* (8.5...8.7)

R. A. $1^h\ 53^m\ 52^s$ Decl. + 6° 7′

My early measures are omitted in the *General Catalogue*. There is no change in 25 years.

1879.88	117°.2	45″.47	2n	β^3

1050. Σ 197. (7.3...8.3)

R. A. $1^h\ 53^m\ 59^s$ Decl. + 34° 43′

A and C (13.2)

1909.802	68°.70	50″.92
.818	68.40	50.55
.838	67.95	50.49
1909.82	68.35	50.65

Measured for an independent determination of the proper motion of A. This from the measures of AB is 0″.108 in 53°.0.

1051. 49 *Cassiopeiae.* β 785. (5.5...13.0)

R. A. $1^h\ 54^m\ 4^s$ Decl. + 75° 32′

A and B

1911.775	243°.4	5″.56
.777	243.7	5.34
.835	246.2	5.32
1911.79	244.4	5.41

A and C (14.2)

1911.775	128°.5	28″.00
.777	128.8	28.68
.813	127.9	27.45
1911.79	128.4	28.04

There is no sensible change in AB since 1881. The proper motion of 49 *Cassiopeiae* is very uncertain in direction and amount from the catalogues; I have, therefore, measured an exceedingly faint third star.

Auwers	0″.041	in	242°.2
Boss	0.018	in	205.0

1074. 10 *Arietis.* Σ 208. (6.2...8.4)

R. A. $1^h\ 56^m\ 50^s$ Decl. + 25° 21′

AB and C (13.5)

1912.562	143°.55	99″.61
.622	143.13	98.44
.638	144.30	98.77
1912.61	143.66	98.94

No other measures of the faint star. The proper motion of the binary system is given:

Auwers	0″.123	in	83°.9
Bossert	0.163	in	90.0
Boss	0.139	in	83.4

1083. 61 *Ceti.* H V. 102. (6.0...9.0)

R. A. $1^h\ 57^m\ 39^s$ Decl. — 0° 55′

A and B

1908.652	193°.50	42″.68
.671	193.57	42.96
.689	193.58	43.16
1908.67	193.55	42.93

A and C (11.9)

1908.652	325°.75	83″.27
.671	325.88	82.71
.689	325.68	83.58
1908.67	325.77	83.19

The measures of C should be continued. The motion of A is:

Boss	0″.088	in	116°.1
Auwers	0.081	in	135.5
Bossert	0.144	in	123.7

1094. S 405. (6.0...6.2)

R. A. $1^h\ 59^m\ 14^s$ Decl. + 79° 7′

A and B

1912.545	274°.60	55″.84
.562	275.08	55.99
.564	274.83	55.71
1912.55	274.84	55.85

B and C (13.5)

1912.562	224°.55	51″.17
.564	224.70	50.94
1912.56	224.62	51.05

The large stars are Groombridge 445 and 443. As there is no relative change, the proper motions must be the same. From the Groombridge catalogue we have:

A	0″.040	in	4°.2
B	0.057	in	1.9

The meridian positions show no relative change:

1810	271°.8	55″.3	Groombridge
1842	276.2	56.2	O. Arg. N.

1103. A. G. 31. (9.5...12.8)

R. A. $2^h\ 0^m\ 25^s$ Decl. + 14° 5′

1908.785	147°.2	32″.91
.788	146.1	31.59
.824	146.9	32.37
1908.80	146.7	32.29

Disagrees with former positions in angle and distance.

1110. H 2114

R. A. $2^h\ 1^m\ 51^s$ Decl. — 26° 1′

No description by Herschel as a double star, but said to be involved in a "nebulous atmosphere," referring to *h* 196 (= *h* 2460). This has a central point which may be a star, or only a condensation of the nebula. It is probable that this and a near star make H 2114.

Star (11.5) and *h* 196 (12.7)

1910.678	286°.0	14″.30

1111. Espin 48. (7.5...11.8)

R. A. $2^h\ 2^m\ 11^s$ Decl. + 42° 17′

1907.542	190°.5	9″.88
.562	189.9	9.95
.578	190.4	10.00
1907.56	190.3	9.94

The only other measure is in G. C. Part I.

1116. 14 *Arietis.* H VI. 69. (5.2...8.5)

R. A. $2^h\ 2^m\ 35^s$ Decl. + 25° 22′

A and B

1911.564	36°.50	93″.41
.583	36.43	93.09
.625	36.28	93.18
.644	36.38	93.18
1911.60	36.40	93.21

A and C (7.7)

1911.564	278°.83	105″.88
.583	278.23	106.15
.625	278.35	106.14
.644	278.40	105.55
1911.60	278.47	106.06

There is no change in either star, and the proper motion of B given in G. C. Part II is obviously wrong. For the large star we have:

Auwers	0″.072	in	119°.2
Boss	0.087	in	115.2

1119. H 2113. (9.5...12.5)

R. A. $2^h\ 2^m\ 55^s$ Decl. + 70° 43′

1907.731	199°.1	18″.62
.750	198.1	18.62
1907.74	198.6	18.62

No other measures.

1121. H 1109. (9.5...9.7)

R. A. $2^h\ 3^m\ 6^s$ Decl. + 38° 37′

1909.725	173°.5	26″.08
.742	173.4	26.12
1909.73	173.4	26.10

H 1109 and *h* 197

1909.706	283°.1	177″.76
.722	283.6	178.82
1909.71	283.3	178.29

Bisection of *h* 197 not very exact.

1124. H 2116. (9.1...12.4)

R. A. $2^h\ 3^m\ 33^s$ Decl. — 10° 45′

A and B

1909.802	160°.2	28″.19
.838	158.2	28.50
1909.82	159.2	28.34

H 2116 (A) and *h* 199

1909.703	338°.0	186″.98
.722	337.2	185.92
1909.71	337.6	186.45

H 2116 and *h* 200

1909.703	354°.6	163″.44
.722	354.2	163.64
1909.71	354.4	163.54

H 2116 and *h* 201

1909.703	56°.2	227″.52
.722	56.4	226.96
1909.71	56.3	227.24

H 2116 and *h* 202

1909.703	92°.4	253″.10
.722	92.7	253.43
1909.71	92.5	253.26

h 200 and *h* 199

1909.703	278°.0	56″.9
.722	279.6	56.1
1909.71	278.8	56.5

Small, round and very much alike.
The only other measures of AB are recent.

1131. OΣ (App.) 24. (6.7...8.0)

R. A. $2^h\ 4^m\ 31^s$ Decl. + 56° 39′

A and B

1907.675	331°.78	63″.55
.692	332.00	63.89
.695	331.63	63.65
1907.69	331.80	63.70

A and C (10.6)

1907.692	215°9	102″41
.695	215.9	102.68
1907.69	215.9	102.54

B and C

1907.692	192°0	142″62
.695	192.1	142.47
1907.69	192.0	142.54

The relative motion of A and B is known with great accuracy. From the measures of AB the apparent motion of A is:

0″251 in 118°5

The third star, measured from each, will show hereafter how this motion is to be divided for the bright stars.

The proper motion of A from meridian positions is given:

Stumpe	0″337	in	126°0
A. G. Hels.	0.347	in	124.3
Porter	0.319	in	126.3

1136. Σ 225. (8.0...11.2)

R. A. $2^h 5^m 5^s$ Decl. + 53° 39′

A and C (10.4)

1908.597	161°25	150″45
.613	161.00	150.32
.633	161.16	150.26
1908.61	161.14	150.34

An earlier position is:

1881.09 161°00 149″29 3n Bl

The proper motion of A is given:

A. G. Harv. 0″034 in 270°

This is confirmed, except as to direction, by the measures of AC.

1148. Σ 230. (7.5...8.7)

R. A. $2^h 6^m 28^s$ Decl. + 57° 56′

1907.657	257°9	23″97
.675	257.6	24.02
.692	257.7	23.90
1907.67	257.7	23.96

Relatively fixed.

1149. 66 *Ceti.* Σ 231. (6.0...7.8)

R. A. $2^h 6^m 39^s$ Decl. — 2° 57′

A and B

1908.709	232°0	15″82
.711	231.1	16.01
.766	231.4	15.88
1908.73	231.5	15.90

A and C (11.8)

1908.824	61°29	172″92
.843	61.09	172.78
.862	61.00	172.36
1908.84	61.13	172.69

The large common proper motion of the bright stars is well known. For future use I have connected the nearest outside star.

Auwers	0″358	in	98°2
Porter	0.346	in	99.6
Boss	0.374	in	98.3

Hd 56 (No. 1142) should be in the field. There must be a large error in the Harvard place. I could not find it any where in the vicinity.

1163. OΣ (App.) 25. (6.1...7.1)

R. A. $2^h 8^m 29^s$ Decl. + 56° 30′

1907.657	204°43	102″93
.692	204.50	102.62
.695	204.36	102.68
1907.68	204.43	102.74

The proper motion, if any, is very small, and probably common to both stars.

Greenwich	0″030	in	126°9
Boss	0.015	in	90.0

1164. Σ 234. (7.8...8.7)

R. A. $2^h 8^m 34^s$ Decl. + 60° 48′

AB and C (10.9)

1910.608	239°90	82″59
.627	239.78	82.17
.666	239.95	82.69
1910.63	239.88	82.48

For proper motion of AB; conditions not good enough for close pair.

1174. δ *Trianguli.* (5.1...13.8)

R. A. $2^h 9^m 36^s$ Decl. + 33° 41′

1907.675	336°70	65″45
.692	337.40	65.54
.772	336.77	65.22
1907.71	336.96	65.40

The only prior measures are my own, given in the *General Catalogue*. The interval is too short at this time to make any correction to the large proper motion of δ *Trianguli.*

Auwers	1″144	in	101°2
Boss	1.179	in	102.0

1175. *χ Persei.* β 1170. (6.3...)

R. A. $2^h\, 9^m\, 39^s$ Decl. + 56° 57′

A and BC (11.0)

1910.971	353°.77	69″.91
11.529	353.83	69.93
11.545	354.09	69.87
1911.35	353.90	69.90

From the four sets of measures on 10 n (1879-1911) the proper motion of the large star is:

0″.052 in 281°.3

Most of the meridian values are discordant and too small.

Auwers	0″.068	in	261°.5
Groombridge	0.011	in	296.8
Boss	0.007	in	277.8
Van Maanan	0.022	in	285.9

A and D (8.8)

1910.971	136°.33	123″.09
11.529	136.13	122.85
11.545	136.17	123.21
1911.35	136.21	123.05

1181. Σ 242 *rej.* (6.7...10.0)

R. A. $2^h\, 10^m\, 20^s$ Decl. — 10° 23′

1907.692	236°.3	55″.67
.788	236.1	55.46
.791	234.9	55.43
1907.76	235.8	55.52

The five sets of measures (1877-1907) give for the corrected proper motion of A:

Measures	0″.265	in	105°.8
Porter	0.300	in	102.7

1193. OΣ (App.) 26. (6.1...6.5)

R. A. $2^h\, 11^m\, 2^s$ Decl. + 59° 28′

A and B

1910.971	199°.90	63″.26
11.529	199.73	63.47
11.545	199.73	63.23
1911.35	199.79	63.32

A and C (10.2)

1910.971	133°.10	71″.99
11.529	132.85	72.33
11.545	132.97	72.35
1911.35	132.97	72.22

B and C

1910.971	81°.83	74″.75
11.529	81.70	75.16
11.545	81.98	75.64
1911.35	81.84	75.18

As these large stars are relatively fixed, and have a common proper motion, if any at all, I have connected a third small star. The bright stars are not in Boss' *General Catalogue.*

1198. 10 *Trianguli.* H 1115. (6.0...12)

R. A. $2^h\, 11^m\, 59^s$ Decl. + 28° 5′

1908.766	204°.9	57″.27
.788	204.8	57.51
.804	205.2	57.43
1908.79	205.0	57.40

The large star has no sensible or certain proper motion:

Auwers	0″.015	in	344°.2
Boss	0.012	in	99.5

The measures of the small star should be continued.

1206. H 327. (8.7...10.2)

R. A. $2^h\, 13^m\, 10^s$ Decl. — 7° 24′

1909.802	315°.34	23″.96
.838	315.47	23.55
1909.82	315.40	23.75

H 327 (A) and *h* 215

1909.802	355°.4	202″.9
.838	355.1	202.4
1909.82	355.2	202.6

For the last we have:

1899.92	354°.9	203″.2	Kobold.

In the *General Catalogue* for the Dreyer number 823 read 883.

1209. o *Ceti.* H VI. 1. (Var...13.0)

R. A. $2^h\, 13^m\, 17^s$ Decl. — 3° 31′

A and C (9.3)

1909.627	79°.28	117″.22
.630	79.40	116.71
.649	79.05	117.47
.666	79.20	117.18
1909.64	79.23	117.14

From the five positions cited, by OΣ, Eng. and β on 16 n (1864-1909) we have for the corrected proper motion of o *Ceti:*

0″.222 in 179°.6

The later measures will not sensibly change this result.

A and C

1911.622	79°.03	117″.20
.625	78.95	117.53
.644	78.88	117.02
.663	79.11	117.59
1911.64	78.99	117.33

A and B

1911.644	85°.23	73″.08
.663	84.83	73.33
.720	84.95	72.74
1911.67	85.00	73.05

B and C

1911.720	69°.02	45″.53
.775	69.17	45.62
.777	68.77	45.22
1911.76	68.99	45.46

Some of the proper motions from star catalogue positions are:

Auwers	0″.231	in	185°.9
Boss	0.237	in	180.4
Newcomb	0.229	in	179.2

1217. 9 *Persei.* β 875. (5.5...12.3)

R. A. $2^h\ 14^m\ 0^s$ Decl. + 55° 18′

1911.813	162°.8	11″.23
.931	161.5	11.41
.942	161.4	11.51
1911.89	161.9	11.38

If the principal star has any proper motion, it is very uncertain. There is no material change in the place of the faint companion.

Auwers	0″.023	in	242°.1
Boss	0.005	in	90.0
Groombridge	0.013	in	212.1

1224. Σ 254. (8.5...10.0)

R. A. $2^h\ 14^m\ 48^s$ Decl. + 23° 5′

1912.619	351°.1	12″.12
.638	352.9	12.10
.678	352.2	12.08
1912.64	352.1	12.10

The measures of the small star give the proper motion of A with the greatest accuracy, as the time base is more than eighty years. The four positions by Σ, Δ and β, on 11 n (1831-1912) give for this movement:

0″.051 in 270°.6

1239. A. G. 38. (8.7...8.9)

R. A. $2^h\ 16^m\ 45^s$ Decl. + 14° 52′

A and B

1908.709	260°.58	34″.44
.728	260.73	34.53
.766	260.90	34.48
1908.73	260.74	34.48

A and C (11.5)

1908.709	180°.12	126″.16
.766	180.63	126.10
1908.74	180.37	126.13

The larger components are supposed to have some proper motion. So far the measures of B show no change. No other measures of the distant star.

1260. β 517. (7.5...12.5)

R. A. $2^h\ 18^m\ 54^s$ Deecl. — 4° 26′

A and C (11.5)

1912.675	289°.38	55″.83
.695	289.57	56.35
.717	290.60	56.18
1912.69	289.85	56.12

It is evident from the measures of both companions that the principal star (Lalande 4486) has no material proper motion.

1262. ι *Cassiopeiae.* Σ 262

R. A. $2^h\ 19^m\ 10^s$ Decl. + 66° 52′

C and D

1908.520	56°.90	206″.12
.537	56.88	206.20
.556	57.00	205.83
1908.54	56.93	206.05

For comparison we have:

1880.42	56°.70	205″.66	2n	Bl

The proper motion of the large star, if any, is very uncertain from meridian positions:

Auwers	0″.028	in	270°.0
Boss	0.014	in	345.9
Newcomb	0.010	in	350.5

1269. OΣ (App.) 27. (6.7...7.7)

R. A. $2^h\ 20^m\ 19^s$ Decl. + 10° 2′

A and B

1910.950	31°.90	73″.42
10.971	31.97	73.19
11.088	31.83	73.76
1911.00	31.90	73.46

A and *a* (11.4)

1910.971	154°.85	62″.12
11.088	154.65	62.22
1911.03	154.75	62.17

No certain change in AB since 1875.

1280. Σ 270. (7.2...9.0)

R. A. $2^h\ 22^m\ 21^s$ Decl. + 55° 1′

A and C (10.6)

1910.739	337°.9	36″.18
.742	338.2	36.46
.760	337.9	36.27
1910.75	338.0	36.30

Since the proper motion, if any, is common to both stars, only measures of the third star are needed.

A. G. Harv. 0″.138 in 127°.6

1289. Σ 271. (6.5...11.0)

R. A. $2^h 23^m 38^s$ Decl. + 24° 42′

A and C (12.7)

1911.813	34°.40	112″.42
.835	34.60	112.70
.870	34.83	111.64
1911.84	34.61	112.25

For the proper motion of AB.

Boss	0″.109	in	139°.5
A. G. Berlin	0.106	in	140.1
Küstner	0.097	in	146.7

1291. β 304. (7.5...11.5)

R. A. $2^h 24^m 5^s$ Decl. + 36° 56′

1908.520	283°.0	20″.26
.613	282.7	19.94
.636	283.4	19.90
.652	282.5	19.73
1908.61	282.9	19.96

Distance increasing from proper motion of the large star of about 0″.08 in 102°.

1294. Ku 10. (9.4...9.8)

R. A. $2^h 24^m 14^s$ Decl. + 32° 23′

1908.613	355°.9	3″.30
.636	358.5	3.42
.692	355.0	3.38
1908.65	356.5	3.37

1299. OΣ 42. (7.0...7.5)

R. A. $2^h 25^m 6^s$ Decl. + 51° 47′

AB and C (10.4)

1909.627	348°.02	91″.21
.649	347.73	91.48
.666	347.85	91.08
1909.65	347.87	91.26

The close pair has no certain proper motion.

Groombridge	0″.002	in	241°.9
Battermann	0.017	in	229.7

From the astrographic positions:

1903.96	348°.0	90″.63	Catania.

AB and DM (51°) 589 (9.5)

1909.627	82°.80	125″.58
.649	82.65	125.39
.666	82.90	125.84
1909.65	82.78	125.60

The relation of these stars from transit and photographic positions is given:

1875	83°.3	124″.7	A. G. Harv.
1903.95	83.5	125.1	Catania.

1317. Σ 277. (7.7...11.0)

R. A. $2^h 27^m 57^s$ Decl. + 59° 22′

A and C (10.0)

1908.537	22°.45	161″.90
.556	22.20	161.66
.559	22.14	161.74
1908.55	22.26	161.77

No evidence of change.

1881.48	22°.43	161″.19	3n	Bl

1329. OΣ (App.) 28. (6.1...7.1)

R. A. $2^h 29^m 37^s$ Decl. + 62° 4′

1910.684	147°.00	68″.10
.720	147.70	67.73
.739	147.40	67.73
1910.71	147.37	67.85

No relative motion since 1875.

1341. Σ 282. (8.3...8.3)

R. A. $2^h 31^m 8^s$ Decl. + 65° 8′

1907.791	295°.1	7″.01
.807	293.7	7.06
.810	295.1	6.90
1907.80	294.6	6.99

Without change.

1350. A. G. 43. (9.4...9.4)

R. A. $2^h 32^m 20^s$ Decl. + 14° 55′

1906.906	59°.2	2″.70
6.964	58.9	2.72
7.675	60.4	2.67
1907.18	59.5	2.70

Prior measures discordant in distance.

1366. A. G. 45. (9.4...9.5)

R. A. $2^h 33^m 49^s$ Decl. + 7° 22′

1907.636	342°.1	4″.69
.638	342.1	4.64
.675	342.2	4.85
1907.65	342.1	4.73

No other measures.

1369. H 2151. (6.9...13.1)

R. A. $2^h 34^m 1^s$ Decl. + 74° 54′

1912.564	114°.3	15″.81
.622	112.7	16.11
.638	112.7	15.01
1912.61	113.2	15.64

The later measures compared with the single position by HΣ in 1885 gives for the proper motion of the principal star:

0″.054 in 201°.1

No motion found in the star catalogues. The companion is very faint.

1374. Σ 291. (7.4...7.7)

R. A. $2^h 34^m 23^s$ Decl. + 18° 17′

A and B

1907.692	118°.6	3″.19
.695	117.4	3.39
.769	118.9	3.14
1907.72	118.3	3.24

A and C

1907.692	241°.2	65″.55
.695	241.2	65.35
.769	241.2	65.26
1907.72	241.2	65.39

B and C

1907.692	243°.8	67″.53
.695	243.9	67.35
1907.69	243.85	67.44

South's angle of AC is 31°.5 *sp*. This was erroneously reduced as *sf;* therefore in Part I of G. C. for 121°.5 read 238°.5.

1378. OΣ 45. (7.0...9.2)

R. A. $2^h 34^m 39^s$ Decl. + 4° 21′

1909.649	290°.6	1″.30
.666	292.1	1.31
1909.66	291.3	1.30

h 263 and star 10.7 m

1909.627	191°.32	145″.64
.630	192.00	145.30
1909.63	191.66	145.47

h 263 is about $2\frac{1}{2}^m$ *f* and 6′ *n* of OΣ 45.

1379. H 1122 (9.5...10.2)

R. A. $2^h 34^m 42^s$ Decl. + 63° 39′

1908.597	216°.5	10″.26
.633	216.0	10.31
.636	217.6	10.18
1908.62	216.7	10.25

No other measures.

1384. β 521. (6.2...11.2)

R. A. $2^h 34^m 59^s$ Decl. + 47° 45′

1911.813	153°.8	5″.99
.835	150.3	5.96
.931	151.6	6.01
1911.86	151.9	5.99

Change uncertain. The large star has no sensible proper motion:

Groombridge 0″.015 in 317°.3

1389. Σ 293. (8.5...11.7)

R. A. $2^h 35^m 31^s$ Decl. + 56° 33′

A and B

1909.802	84°.1	9″.33
.818	83.8	9.04
.821	84.2	8.95
1909.81	84.0	9.11

The four sets of measures by Σ, Δ, A and β, each on 3 n, give for the proper motion of A:

0″.054 in 305°.8

A and C (12.5)

1909.802	335°.07	79″.64
.818	335.03	79.72
.838	334.97	79.42
1909.82	335.02	79.59

A and DM (56°) 702

1909.818	342°.50	189″.14
.821	342.60	189.09
.838	342.50	188.84
1909.83	342.53	189.02

No other measures of C. For the other we have:

1872.1 341°.9 191″.5 A. G. Hels.

As might be expected, these positions give substantially the same proper motion of A:

0″.086 in 305°.4

1393. *θ Persei.* Σ 296. (4.2...10.0)

R. A. $2^h 35^m 59^s$ Decl. + 48° 43′

A and C (9.5)

1910.739	225°.70	73″.89
.742	226.01	74.28
.777	225.78	74.21
.780	225.81	74.44
1910.76	225.83	74.20

The proper motion of *θ Persei* from measures of AC (1853-1903) is:

Measures	0″.352	in	104°.2
Auwers	0.340	in	105.2
Boss	0.350	in	104.9

1398. β 306. (6.4...11.0)

R. A. $2^h\ 36^m\ 53^s$ Decl. + 25° 8′

A and C (12.1)

1910.818	89°.50	50″.55
.838	90.31	50.21
.931	89.93	50.22
1910.86	89.91	50.33

For an independent value of the proper motion of AB.

Bossert 0″.163 in 90°

1406. Espin 9. (8.0...11.6)

R. A. $2^h\ 37^m\ 55^s$ Decl. + 52° 39′

A and B

1907.807	29°.9	2″.45
7.867	27.8	2.70
8.559	25.1	2.49
8.573	26.1	2.42
1908.20	27.2	2.52

A and C (13.5)

1907.867	302°.9	10″.22
8.597	305.3	10.37
1908.23	304.1	10.30

The faint star not previously seen.

1410. Σ 303. (8.5...9.5)

R. A. $2^h\ 38^m\ 35^s$ Decl. — 2° 28′

1908.898	179°.2	5″.97
9.630	180.4	5.65
9.703	179.9	5.70
1909.41	179.8	5.77

No change.

1417. Hn 64. (8.2...12.0)

R. A. $2^h\ 39^m\ 20^s$ Decl. + 1° 3′

1906.796	216°.0	4″.85
7.636	218.5	5.22
7.638	219.7	5.39
1907.36	218.1	5.15

Probably fixed.

1427. Σ 305. (7.3...8.2)

R. A. $2^h\ 40^m\ 41^s$ Decl. + 18° 52′

A and C (12.9)

1910.931	34°.18	88″.69
.933	33.63	88.80
.971	33.67	88.35
1910.94	33.83	88.61

For proper motion. No other measures of C.

Battermann	0″.174	in	150°.2
Porter	0.221	in	140.2

1428. Espin 120. (8.8...13.4)

R. A. $2^h\ 41^m\ 6^s$ Decl. + 53° 26′

1907.807	72°.3	4″.27
8.559	72.4	4.45
8.597	72.9	4.11
1908.32	72.5	4.28

1434. Espin 51. (9.3...10.4)

R. A. $2^h\ 41^m\ 36^s$ Decl. + 53° 26′

A and B

1907.807	308°.4	67″.72
7.867	308.5	68.05
8.559	308.3	67.75
1908.08	308.4	67.84

B and C (10.6)

1907.807	257°.3	2″.34
7.867	256.4	2.44
8.559	257.5	2.20
1908.08	257.1	2.33

No other measures.

1435. A. G. 52. (9.5...9.8)

R. A. $2^h\ 41^m\ 38^s$ Decl. + 7° 3′

1907.692	51°.9	17″.61
.695	50.9	17.28
.769	50.3	17.33
1907.72	51.0	17.41

The distance given in G. C. Part I is much too large.

1450. 41 *Arietis.* OΣ 47 *rej.* (4.1...11.2)

R. A. $2^h\ 42^m\ 55^s$ Decl. + 26° 46′

A and B

1912.675	275°.1	23″.62
.695	273.1	23.65
.717	274.8	23.36
1912.69	274.3	23.54

A and C (11.0)

1912.675	211°.4	31″.56
.695	210.8	31.62
.717	210.4	31.50
1912.69	210.9	31.56

A and D (9.5)

1912.675	231°.75	125″.12
.695	231.80	125.03
.717	231.88	124.55
1912.69	231.81	124.90

The distant star is DM (26°) 470. From the measures of the small stars (1852-1912), we have for the proper motion of 41 *Arietis:*

AB	R. A. + 0″.085	Decl. — 0″.113
AC	0.073	0.105
AD	0.043	0.111
	+ 0.067	— 0.110

Therefore the corrected proper motion is:

0″.129 in 148°.6

Some of the prior determinations from the catalogue are:

Newcomb	0″.130	in	148°.7
Auwers	0.117	in	154.1
Boss	0.131	in	149.4
Hussey	0.139	in	145.3

The last value is from measures of AB and AC to 1898.

1457. Σ 312. (7.1...8.0)

R. A. 2ʰ 44ᵐ 11ˢ Decl. + 72° 24′

A and C (9.2)

1912.564	128°.93	42″.60
.583	128.57	42.38
.619	128.55	42.31
1912.59	128.68	42.43

As there has been no change in the small star in 80 years, it is safe to say that the Struve pair has no proper motion. There probably is an error in the R. A. sign in one of the Greenwich catalogues:

Groombridge	0″.082	in	127°.7
Gr. (1900)	0.082	in	232.3

1463. Σ 316. (8.5...8.7)

R. A. 2ʰ 44ᵐ 34ˢ Decl. + 36° 48′

1907.692	134°.6	14″.29
.695	134.7	14.33
.711	134.8	14.31
1907.70	134.7	14.31

Very little change, if any.

1474. A. G. 56. (9.1...9.1)

R. A. 2ʰ 46ᵐ 24ˢ Decl. + 10° 11′

1906.796	108°.5	6″.62
7.022	109.7	6.78
7.636	110.4	6.90
1907.15	109.5	6.77

Earlier measures discordant.

1478. A. G. 57. (9.3...10.5)

R. A. 2ʰ 46ᵐ 55ˢ Decl. + 11° 49′

1906.796	348°.7	10″.78
7.022	347.5	10.58
7.636	348.3	10.82
1907.15	348.2	10.73

Measures discordant.

1489. Σ 324 *rej.* (6.7...12.2)

R. A. 2ʰ 48ᵐ 27ˢ Decl. + 46° 41′

1910.931	203°.4	24″.74
.933	203.0	24.49
.950	201.9	24.19
1910.94	202.8	24.47

The other measures are of late date.

1506. Ho 219. (8.1...12.2)

R. A. 2ʰ 51ᵐ 57ˢ Decl. + 37° 24′

1907.692	249°.4	6″.74
.695	250.4	7.02
.772	248.6	6.93
1907.72	249.5	6.90

The declination of this star in Part I of the *General Catalogue* is printed + 34° 24′ instead of + 37° 24′.

1519. H 2167. (8.5...9.0)

R. A. 2ʰ 53ᵐ 7ˢ Decl. + 44° 25′

A and B

1909.706	33°.2	37″.65
.722	33.0	37.42
.725	33.4	37.60
1909.72	33.2	37.56

H 2167 (B) and *h* 277

1909.706	89°.6	48″.2
.722	89.5	47.3
.725	89.6	49.2
1909.72	89.6	48.2

H 2167 (A) and *h* 277

1909.722	64°.2	75″.8
.725	64.7	77.4
1909.72	64.4	76.6

No other measures.

The Rosse nebula in the field with *h* 277 is large, very diffused, and with no central condensation.

1525. A. G. 60. (9.0...9.2)

R. A. $2^h\ 53^m\ 43^s$ Decl. + 14° 3′

1907.636	160°.2	6″.54
.638	161.1	6.67
.675	160.0	6.39
1907.65	160.4	6.53

Prior distances discordant.

1539. H 2169. (9.3...9.4)

R. A. $2^h\ 55^m\ 25^s$ Decl. + 52° 3′

1908.785	311°.3	7″.93
.788	311.4	7.99
.804	311.7	7.91
1908.79	311.5	7.94

Only late measures.

1544. *γ Persei.* H 2170. (3.0...11.0)

R. A. $2^h\ 56^m\ 6^s$ Decl. + 53° 2′

1909.802	325°.02	56″.70
.818	325.18	56.86
.821	324.84	56.91
.838	325.23	57.24
1909.82	325.07	56.93

The amount and direction of the proper motion of *γ Persei* as derived from meridian observations seem to be very uncertain, and they only show that the motion if any is small. Some of the results are:

Auwers	0″.011	in	236°.4
Groombridge	0.023	in	161.7
Newcomb	0.010	in	115.0
Boss	0.010	in	158.2

Nothing can be inferred from values so contradictory. The measures of the small star show that the movement of the large star is substantially all in R. A. The three positions (1879-1909) give for the proper motion of *γ Persei:*

0″.053 in 261°.3

The measures of the small star should be continued.

1550. Σ 341. (7.7...9.7)

R. A. $2^h\ 56^m\ 57^s$ Decl. — 2° 23′

1910.933	225°.8	8″.82
11.088	227.9	8.55
11.720	226.4	8.71
1911.25	226.7	8.69

Apparently fixed.

1559. 52 *Arietis.* Σ 346. (6.0...6.0)

R. A. $2^h\ 58^m\ 24^s$ Decl. + 24° 47′

AB and E (12.3)

1911.870	191°.47	134″.41
.931	191.00	133.61
.947	191.53	133.01
.950	191.40	133.44
1911.92	191.35	133.62

Faint star for the proper motion of AB. This is very uncertain from meridian positions:

Auwers	0″.032	in	245°.6
Boss	0.015	in	163.7

1575. Σ 354 *rej.* (8.6...9.4)

R. A. $3^h\ 1^m\ 4^s$ Decl. + 24° 7′

1911.813	53°.1	34″.32
.835	53.7	34.49
.870	52.5	34.07
1911.84	53.1	34.29

If the A. G. proper motion of A is correct, the companion is moving with the other.

A. G. Berlin 0″.096 in 238°.7

1583. Σ 6, App. I. (7.0...7.0)

R. A. $3^h\ 2^m\ 47^s$ Decl. + 7° 0′

1908.671	163°.07	81″.20
.689	162.75	81.31
.692	162.95	80.93
.709	162.89	80.94
1908.69	162.91	81.09

No relative change.

1586. H 1132. (9.3...9.4)

R. A. $3^h\ 3^m\ 48^s$ Decl. + 66° 33′

1907.711	23°.8	7″.18
.791	23.2	7.19
.807	22.3	7.28
1907.77	23.1	7.22

No other measures.

1590. H V. 117. (7.5...8.5)

R. A. $3^h\ 4^m\ 17^s$ Decl. + 21° 58′

1908.845	320°.6	32″.54
.862	320.2	32.97
.884	319.8	32.90
1908.86	320.2	32.80

These measures show that the companion has the same proper motion of 0″.113 in 165°.8.

1597. Ho 501. (8.0...12.0)

R. A. $3^h 4^m 52^s$ Decl. + 34° 32′

1907.772	207°1	9″38
.807	203.5	9.40
.810	205.6	9.43
1907.80	205.4	9.40

Prior measures very discordant in distance.

1614. OΣ 52. (6.4...7.0)

R. A. $3^h 7^m 2^s$ Decl. + 65° 13′

AB and C (12.7)

1911.950	222°40	80″88
12.564	223.00	79.72
12.269	222.93	80.82
1912.38	222.78	80.47

No other measures of the small star. The proper motion of the close pair is somewhat uncertain. In addition to the values given in the *General Catalogue* we have:

Auwers	0″032	in	277°1
Greenwich	0.018	in	293.2
Boss	0.018	in	337.9

1617. β 530. (7.0...9.7)

R. A. $3^h 7^m 18^s$ Decl. + 22° 30′

A and B

1911.835	39°43	47″06
.870	40.10	47.17
.931	40.03	47.45
1911.88	39.85	47.23

From the four sets of β measures (1879-1911) the proper motion of the principal star is:

0″065 in 80°0

From the star catalogue places:

A. G. Berlin 0″055 in 90°0

1628. H 1133. (6.9...11.3)

R. A. $3^h 8^m 35^s$ Decl. + 69° 19′

1906.813	203°8	30″64
7.562	203.9	30.88
7.578	204.0	31.14
7.581	203.8	31.11
1907.38	203.9	30.94
1908.845	203°8	30″77
.862	204.4	30.78
.884	204.7	31.31
1908.86	204.3	30.95

There seems to be no relative motion. The proper motion of the large star is:

Battermann	0″019	in	139°8
Schroeter	0.022	in	140.9
Boss	0.035	in	88.4
Groombridge	0.031	in	109.0

1642. Σ 368. (8.5...8.5)

R. A. $3^h 10^m 30^s$ Decl. + 68° 4′

A and C (12.7)

1911.835	36°27	66″24
.931	36.45	65.71
.942	37.20	65.96
1911.90	36.64	65.97

B and C

1911.870	38°38	64″64
.942	39.00	65.63
1911.90	38.69	65.08

For the proper motion of AB.

Schroeter 0″152 in 155°0

1655. β 1294. (8.8...9.0)

R. A. $3^h 12^m 24^s$ Decl. + 46° 15′

1906.813	228°5	6″23
7.562	228.7	6.42
7.581	229.6	6.41
1907.32	228.9	6.35

The components are *red* and *green.*

1663. Σ 375. (8.0...10.1)

R. A. $3^h 13^m 19^s$ Decl. + 23° 15′

A and C (13.2)

1911.777	289°63	64″83
.813	289.90	65.06
.835	290.03	64.88
1911.81	289.85	64.92

For the proper motion of AB.

A. G. Berlin 0″081 in 170°2

1668. Σ 377. (8.3...8.7)

R. A. $3^h 13^m 43^s$ Decl. + 18° 45′

A and C (11.5)

1912.678	221°2	24″53
.695	222.7	24.47
.717	222.6	24.84
1912.69	222.2	24.61

Very little, if any, change in the faint companion, and only a little motion in the close pair.

1698. Σ 384 (7.8...9.0)

R. A. $3^h\ 18^m\ 46^s$ Decl. + 59° 29′

A and C (10.6)

1908.845	340°.60	117″.02
.862	340.35	116.62
.882	339.95	116.72
1908.86	340.30	116.79

No sensible proper motion.

1879.39	339°.95	117″.09	2n	Bl.

1704. Holmes. (8.8...11.2)

R. A. $3^h\ 20^m\ 2^s$ Decl. + 59° 30′

1907.711	53°.3	5″.03
.772	52.6	5.05
.791	53.9	4.78
1907.76	53.3	4.95

Prior distances discordant. This is DM (59°) 661, the place of which for 1880 is as given here.

1711. Σ 390. (4.8...9.2)

R. A. $3^h\ 20^m\ 51^s$ Decl. + 55° 2′

A and C (10.0)

1910.818	171°.87	109″.95
.838	172.45	109.95
.856	171.63	110.26
1910.84	171.98	110.05

For proper motion. The values from the meridian observations are:

A. G. Harv.	0″.079	in	287°.6
Kustner	0.050	in	247.7
Groombridge	0.028	in	284.6
Boss	0.033	in	266.6

1712. H 3574

R. A. $3^h\ 20^m\ 57^s$ Decl. — 21° 56′

Lack of description makes it impossible to identify this with certainty. The "cometic nebula" referred to by Herschel is I. 60; and *h* 2534 is $1^m\ 40^s$ *p* the place of H 3374.

1720. 66 *Arietis.* β 878. (6.0...12.2)

R. A. $3^h\ 21^m\ 28^s$ Decl. + 22° 23′

A and C (12.4)

1911.625	226°.00	150″.75
.644	226.30	151.55
.663	226.10	151.72
1911.64	226.13	151.34

For the proper motion of AB. This has been given:

Auwers	0″.120	in	185°.3
Porter	0.115	in	186.9
Boss	0.111	in	175.7

1724. β 879. (6.5...12.5)

R. A. $3^h\ 22^m\ 3^s$ Decl. + 10° 58′

1912.675	70°.75	24″.50
.678	70.82	24.80
.695	70.43	24.63
1912.68	70.67	24.64

No sensible change since 1878. No proper motion found in the catalogues. The large star is Lalande 6400.

1729. OΣ 56 *rej.* (6.5...10.0)

R. A. $3^h\ 23^m\ 6^s$ Decl. + 47° 27′

1910.950	351°.97	25″.92
11.529	352.08	25.83
11.545	352.53	25.93
1911.34	352.19	25.89

The four positions by Δ, Hu and β on 10 n (1867-1911) give for the proper motion of A:

0″.072 in 169°.5

The meridian value is too small:

Greenwich 0″.045 in 143°.8

1730. H IV. 89. (8.0...9.2)

R. A. $3^h\ 23^m\ 35^s$ Decl. + 19° 41′

A and B

1909.744	146°.55	20″.08
.760	146.35	20.28
1909.75	146.45	20.18

A and C (12.2)

1909.742	203°.55	50″.62
.744	203.86	50.36
.760	203.95	50.96
1909.75	203.79	50.65

As the components have a common proper motion, I have connected a third star. The proper motion of A is:

Porter 0″.203 in 108°.0

1731. Σ 7, App. I. (6.9...7.4)

R. A. $3^h\ 23^m\ 48^s$ Decl. + 27° 19′

1910.838	233°.51	44″.03
.856	233.23	43.90
.876	233.58	44.07
1910.86	233.44	44.00

No change since 1836.

1732. Σ 396. (6.3...8.0)

R. A. 3h 23m 55s Decl. + 58° 22′

A and C (10.8)

1908.845	102°07	164″53
.862	101.72	165.04
.882	101.93	165.55
1908.86	101.91	165.04

The early measures of 1879 differ among themselves in distance by as much as 2″3, but there is no evidence of any change.

1879.64	101°88	165″55	4n	Bl.

No proper motion found for the large star.

1737. Σ 407. (8.2...10.7)

R. A. 3h 24m 16s Decl. — 11° 33′

A and C (12.7)

1912.675	201°82	142″05
.735	201.20	142.29
1912.71	201.51	142.17

No change in AB, but common proper motion:

Porter 0″141 in 200°7

1745. H 2190. (12.0...12.9)

R. A. 3h 24m 52s Decl. + 72° 11′

1909.627	320°9	14″93
.649	315.7	14.22
.706	320.2	14.87
1909.66	318.9	14.67

H 2190 and *h* 300

1909.627	162°3	54″24
.649	160.7	54.51
.706	.....	55.15
1909.66	161.5	54.64

No other measures. *h* 300 is some brighter in the middle, but bisection not very exact.

1747. Σ 400. (7.0...8.0)

R. A. 3h 25m 12s Decl. + 59° 38′

AB and C (10.3)

1908.845	238°87	92″21
.862	237.28	92.27
.882	237.30	92.22
1908.86	237.82	92.23

Probably without change.

1879.40	236°97	92″68	2n	Bl.

1748. Hn 65. (9.4...9.8)

R. A. 3h 25m 24s Decl. — 6° 6′

1907.788	7°8	3″89
.791	6.7	3.96
.845	9.8	4.13
1907.81	8.1	3.99

Apparently unchanged.

1750. A. G. 68. (7.5...9.5)

R. A. 3h 25m 37s Decl. + 11° 8′

1906.772	248°9	17″19
.796	248.2	17.09
.813	249.3	17.06
1906.79	248.8	17.11

No motion.

1751. β 787. (8.0...12.0)

R. A. 3h 25m 49s Decl. + 48° 13′

A and C (11.0)

1912.622	176°08	36″20
.638	175.44	36.13
.675	176.05	36.07
1912.64	175.86	36.13

It is certain now that there is no intermediate companion at 12″ distance. The only other measure of C is that given in G. C. Part II.

1755. OΣ 57. (7.5...11.0)

R. A. 3h 26m 20s Decl. + 22° 58′

A and B

1907.692	320°2	9″50
.769	319.7	9.45
.778	320.3	9.58
1907.75	320.1	9.51

A and C (7.0)

1907.692	214°9	70″74
.753	214.4	70.88
.769	214.6	70.45
1907.74	214.6	70.69

C and *c* (13.5)

1907.692	170°8	34″86
.788	168.5	35.05
1907.74	169.6	34.95

The angle of AC in OΣ is 180° in error. It is correctly given by Dembowski, but was changed in Part I of the *General Catalogue* to conform to the other.

The proper motion in R. A. of the following one of the two principal stars is given 0s.0046, but by error in reducing this to arc it was taken as 0s.046. The proper motions by Rechenberg should read:

A	0″.073	in	241°.2
C	0.057	in	256.8

There are no other measures of the faint companion to C.

1759. β 788. (8.3...10.5)

R. A. 3h 27m 9s Decl. + 42° 11′

A and B

1907.807	306°.3	2″.61
.810	306.1	2.52
.845	305.6	2.59
1907.82	306.0	2.57

A and C (8.8)

1907.791	82°.3	34″.17
.807	82.1	34.15
.810	81.7	33.78
.845	82.6	34.23
1907.81	82.2	34.08

No sensible change in either since 1881.

1761. 7 *Tauri.* Σ 412. (6.6...6.7)

R. A. 3h 27m 20s Decl. + 24° 4′

A and B

1908.709	146°.0	0″.18
.824	148.0	0.17
1908.77	147.0	0.17

The proper motion is small:

Auwers	0″.035	in	180°.0
Boss	0.032	in	146.6

1771. Σ 416 *rej.* (8.8...9.7)

R. A. 3h 28m 2s Decl. + 19° 24′

A and *a* (12.0)

1910.893	292°.3	22″.65
.895	291.9	22.41
.931	293.0	22.72
1910.91	292.4	22.59

No early measures of this star.

1772. Σ 415. (8.3...10.0)

R. A. 3h 28m 7s Decl. + 26° 27′

1907.772	52°.4	15″.27
8.636	52.9	15.36
8.652	52.4	15.37
1908.35	52.6	15.33

No change since 1866. There is a 13 m star, 0°.6 : 37″.4.

1781. OΣ (App.) 36. (6.3...7.3)

R. A. 3h 29m 26s Decl. + 63° 29′

1907.578	70°.2	45″.83
.581	70.2	45.79
.657	70.2	45.91
1907.61	70.2	45.84

No change since 1875.

1801. β 1231. (8.2...12.5)

R. A. 3h 32m 45s Decl. + 65° 36′

A and B

1909.744	13°.6	2″.85
.782	16.7	2.04
1909.76	15.1	2.44

A and C (8.3)

1909.744	253°.37	84″.44
.760	253.13	84.76
.780	253.25	84.48
1909.76	253.25	84.56

Further measures of C will give an independent value of the proper motion of AB.

Schroeter	0″.072	in	157°.8

1802. Piazzi III. 97. (6.6...13.0)

R. A. 3h 32m 50s Decl. + 59° 35′

A and B

1909.589	95°.9	20″.68
.627	94.2	20.85
1909.61	95.0	20.76

A and E (10.8)

1908.939	160°.25	168″.40
9.573	160.68	168.09
9.589	160.75	168.19
1909.37	160.56	168.23

The only other measure of the distant star is:

1879.40	160°.17	167″.24	2n	Bl.

In my measures in G. C. Part II for CD read AD. The proper motions of the two principal stars are given in Groombridge:

A	0″.009	in	311°.1
D	0.021	in	52.3

From meridian observations we have for AD:

1810	33°.2	54″.4	Groombridge
1875	37.0	55.6	A. G. Hels.
1893	35.2	55.8	Gr. (10 year)

1816. Σ 433 *rej.* (8.4...9.5)

R. A. $3^h\ 34^m\ 19^s$ Decl. — 8° 28′

1911.720	332°.90	36″.03
.755	333.50	36.13
.775	332.73	36.05
1911.75	333.04	36.07

The only other measures are my own in 1904.

1821. Σ 436. (7.0...8.2)

R. A. $3^h\ 35^m\ 11^s$ Decl. — 13° 0′

1908.671	236°.2	37″.17
.692	236.1	37.35
.750	236.2	37.40
1908.70	236.2	37.31

The apparent motion of A from the measures is:

0″.116 in 69°.4

No third star near enough for the micrometer.

1825. β 1182. (6.4...14.2)

R. A. $3^h\ 35^m\ 30^s$ Decl. + 48° 8′

A and C (13.5)

1910.627	244°.41	18″.57
.660	244.33	18.68
.701	244.20	18.71
1910.66	244.31	18.65

The proper motion of A is:

Battermann 0″.028 in 186°.1

1839. β 1041. (6.2...6.3)

R. A. $3^h\ 37^m\ 19^s$ Decl. + 27° 31′

A and B

1908.692	42°.03	125″.14
.728	41.85	125.36
.750	41.80	124.79
.766	41.80	125.11
1908.73	41.87	125.10

B and C (12.8)

1908.692	334°.6	11″.69
.750	334.7	11.97
.766	333.8	11.94
1908.74	334.4	11.87

The four sets of measures of BC (1888-1908) give for the proper motion of B:

0″.232 in 131°.2

The motion from meridian positions is too large:

Rechenberg 0″.331 in 123°.3

1843. γ *Camelopardali.* H 2200. (4.7...12.0)

R. A. $3^h\ 37^m\ 41^s$ Decl. + 70° 58′

A and B

1909.742	240°.38	56″.35
.760	240.18	55.90
.763	239.78	56.04
.780	240.55	56.60
1909.76	240.22	56.22

The other measures of this are of recent date.

A and C (8.5)

1909.742	84°.12	106″.41
.760	83.95	105.81
.763	83.73	106.79
.780	84.07	106.19
1909.76	83.97	106.30

C is DM (70°) 260. From meridian observations we have:

1842	83°.8	108″.1	O. Arg. N.
1900	83.9	106.9	Greenwich.

The proper motion of the large star is given:

Auwers	0″.059	in	156°.9
Newcomb	0.064	in	152.7
Groombridge	0.054	in	155.1
Boss	0.046	in	140.9

1848. 19 *Pleiadum.* H 3251. (6.0...10.0)

R. A. $3^h\ 38^m\ 5^s$ Decl. + 24° 6′

1911.663	329°.83	68″.11
.736	329.20	68.01
.755	329.13	68.02
1911.72	329.39	68.05

From the measures of the faint star by Hl and β on 10 n (1880-1911) the proper motion of A is:

0″.047 in 128°.2

The meridian observations give:

Auwers	0″.033	in	199°.5
Boss	0.049	in	167.1

1854. Σ 443. (8.2...8.8)

R. A. $3^h\ 38^m\ 47^s$ Decl. + 41° 7′

A and C

1911.663	172°.35	20″.84
.720	172.13	20.66
.755	172.73	20.49
1911.71	172.40	20.66

The proper motion given in the *General Catalogue* from the measures of AC to 1906 will not be sensibly changed by the later position.

Measures	1″.328	in	155°.2
Porter	1.358	in	155.0
Kustner	1.437	in	148.7

1859. 29 *Tauri.* H 2004. (5.5...12)

R. A. $3^h\ 39^m\ 17^s$ Decl. + 5° 41′

1906.772	64°.1	64″.72
.796	64.0	65.39
.813	63.8	65.74
1906.79	64.0	65.28

No early measures. The proper motion of the large star is uncertain:

Auwers	0″.014	in	239°.6
Boss	0.030	in	115.8

1860. H 1139. (7.4...9.1)

R. A. $3^h\ 39^m\ 20^s$ Decl. + 70° 7′

1909.742	175°.1	47″.24
.760	175.1	47.20
.763	175.2	47.09
1909.75	175.1	47.18

B is the 9.3 m star, DM (70°) 263.

The only other measure is of late date. The proper motion of A is given:

Schroeter 0″.056 in 208°.9

1861. H 665. (9.8...10.0)

R. A. $3^h\ 39^m\ 23^s$ Decl. + 30° 26′

A and C (11.3)

1909.706	255°.6	14″.79
.782	255.9	15.11
.838	256.0	15.22
1909.78	255.8	15.04

The only other measure is given in G. C. Part I.

1869. Σ 447. (7.8...9.5)

R. A. $3^h\ 40^m\ 8^s$ Decl. + 37° 58′

1911.663	167°.35	28″.23
.720	167.42	28.13
.736	167.38	28.13
1911.71	167.38	28.16

The principal star has a small proper motion. From the measures of Σ and β (1836-1911) this is:

0″.062 in 281°.0

1877. Σ 446. (7.0...9.2)

R. A. $3^h\ 40^m\ 25^s$ Decl. + 52° 17′

A and B

1910.701	254°.0	8″.73
.703	253.8	8.78
.739	253.9	8.37
1910.71	253.9	8.63

A and C (13.5)

1910.701	37°.5	11″.60
.703	39.5	11.69
.739	39.4	11.82
1910.71	38.8	11.70

A is the brightest star in *h* 308; the others much smaller. No change in AB.

The principal star is given a small proper motion:

Battermann 0″.048 in 221°.7

1882. β 1184

R. A. $3^h\ 41^m\ 14^s$ Decl. + 22° 0′

About 10′ distant from this pair *sp*, is a nebula discovered by Lohse (Dreyer 1456) about a pair of faint stars 130° : 9″; "companion nebulous." In measuring this pair, I could not see any trace of a nebula in the field. The magnitudes of the stars were estimated 10.8 and 11.5.

1909.760	130°.9	9″.36
.938	130.2	9.54
1909.85	130.5	9.45

1886. 30 *Tauri.* Σ 452. (4.5...9.6)

R. A. $3^h\ 41^m\ 41^s$ Decl. + 10° 46′

1911.947	59°.4	9″.10
11.950	59.0	9.18
12.008	57.8	9.12
1911.97	58.7	9.13

The proper motion of 30 *Tauri* is very uncertain in amount and direction. From meridian positions:

Auwers	0″.022	in	199°.3
Boss	0.042	in	121.9

The measures of the faint star show that the motion of A is nearly all in R. A. From the observations of Σ, Δ and β on 12 n (1830-1911) we have:

0″.004 in 283°.5

1888. Σ 456 *rej.* (8.5...9.3)

R. A. $3^n\ 42^m\ 10^s$ Decl. + 1° 13′

1909.936	119°.0	22″.05
10.701	119.9	21.69
10.739	120.3	21.60
1910.46	119.7	21.78

No change apparent from the measures.

1896. A. G. 74. (9.3...9.5)

R. A. $3^h\ 42^m\ 49^s$ Decl. + 12° 33′

1907.772	195°.4	11″.45
.778	195.9	11.91
.791	195.6	11.96
1907.78	195.6	11.77

Prior distances discordant.

1905. Σ 459. (7.8...10.7)

R. A. 3^h 43^m 33^s Decl. + 29° 18′

A and B

1911.931	330°.8	18″.10
.947	330.6	18.49
.950	331.1	18.33
1911.94	330.8	18.31

B and C (13.0)

1911.947	293°.0	53″.48
.950	292.6	53.89
1911.95	292.8	53.68

From the measures of AB the principal star has a proper motion of 0″.065 in about 180°. No other measures of the faint star.

1913. Σ 455. (8.2...8.7)

R. A. 3^h 44^m 57^s Decl. + 69° 10′

A and B

1909.821	166°.3	11″.96
.838	166.1	11.84
.933	166.2	11.91
1909.86	166.2	11.90

No change in AB. The principal star is given a small proper motion:

Schroeter 0″.097 in 109°.2

To determine whether or not AB has any proper motion, I have connected two small stars.

A and C (14.2)

1909.838	331°.73	58″.13
10.627	331.49	58.42
10.666	331.83	58.32
1910.38	331.68	58.29

A and D (12.6)

1909.838	210°.97	96″.57
.933	211.29	96.20
.936	211.08	96.19
1909.90	211.11	96.32

1921. ζ *Persei.* Σ 464. (2.7...9.3)

R. A. 3^h 46^m 35^s Decl. + 31° 32′

A and C (11.1)

1911.947	286°.53	33″.22
11.950	286.25	32.59
12.008	286.68	32.68
1911.97	286.49	32.83

A and D (9.3)

1911.947	196°.98	90″.81
11.950	197.17	91.22
12.008	196.93	91.15
12.011	197.02	91.08
1911.98	197.02	91.06

A and E (10.0)

1911.947	184°.78	119″.73
11.950	184.80	119.96
12.008	184.92	119.74
12.011	184.95	119.76
1911.98	184.86	119.80

The proper motion of ζ *Persei* is wholly uncertain, so far as meridian observations are concerned:

Auwers	0″.005	in	212°.6
Newcomb	0.033	in	163.2
Boss	0.021	in	143.1

The measures of the distant companions show that the proper motion of the large star is very small, if any at all, but further measures are necessary to give a definite value.

1925. Hn 66. (8.0...12.2)

R. A. 3^h 46^m 48^s Decl. — 8° 51′

A and B

1910.701	35°.8	2″.05
.739	37.2	2.12
1910.72	36.5	2.08

A and C (10.7)

1910.678	13°.90	117″.00
.739	14.03	117.48
.760	14.00	117.49
1910.73	13.98	117.32

For the proper motion of AB, if any, I have connected a third star. Three small nebulae by Stone *sf* are too diffused for good measures.

1933. 43 *Persei.* S 440. (5.5...10.3)

R. A. 3^h 47^m 41^s Decl. + 50° 21′

A and C (11.4)

1908.843	133°.28	102″.24
.845	133.57	102.90
.862	132.88	102.66
1908.85	133.24	102.60

No other measures of this. This principal stars have a common proper motion.

Auwers	0″.146	in	149°.0
Porter	0.155	in	147.6
Rogers	0.151	in	141.8
Boss	0.158	in	145.3

1936. Ho 325. (6.5...13.0)

R. A. 3^h 47^m 53^s Decl. + 30° 41′

1910.893	12°.4	22″.93
.895	10.7	22.91
.931	11.7	23.32
1910.91	11.6	23.05

Change doubtful. No proper motion found in the catalogues.

1961. OΣ 98 *rej.* (7.0...8.1)

R. A. $3^h 51^m 3^s$ Decl. + 47° 48′

A and B

1912.619	175°.33	39″.14
.622	175.70	39.42
.638	175.80	39.24
1912.62	175.61	39.27

No sensible change since 1867. No proper motion found for the principal star. I have connected an exceedingly faint star, which was difficult to measure on each night.

B and C (13.7)

1912.622	186°.0	31″.54
.675	182.3	32.23
.678	183.4	30.94
1912.66	183.9	31.57

1969. Σ 475. (8.2...10.6)

R. A. $3^h 52^m 3^s$ Decl. — 7° 28′

1910.933	20°.9	7″.59
10.971	22.2	7.59
11.088	21.5	7.59
1911.00	21.5	7.59

Probably unchanged.

1975. γ *Eridani.* H 3608. (3.1...13.0)

R. A. $3^h 52^m 24^s$ Decl. — 13° 51′

1908.692	241°.80	52″.58
8.750	242.53	52.96
9.703	242.98	52.75
9.725	242.53	52.79
1909.22	242.46	52.77

From the three sets of measures (1877-1909) we have for the proper motion of γ *Eridani:*

0″.124 in 137°.1

From meridian positions:

Auwers	0″.110	in	151°.9
Newcomb	0.130	in	148.1
Boss	0.132	in	148.4

1977. β 1042. (7.5...8.7)

R. A. $3^h 52^m 36^s$ Decl. — 3° 0′

A and BC

1910.739	93°.23	55″.69
.760	93.53	55.84
.770	93.08	55.47
1910.76	93.28	55.67

A and *a* (12.5)

1910.739	249°.7	38″.91
.760	250.5	39.38
.770	250.6	39.41
1910.76	250.3	39.23

The only other measures of the faint star are by Doolittle in 1899.

1983. Σ 476. (7.5...8.7)

R. A. $3^h 53^m 36^s$ Decl. + 38° 20′

A and B

1910.720	286°.0	21″.29
.739	286.4	21.35
.760	286.1	21.15
1910.74	286.2	21.26

The measures show rectilinear motion in AB.

B and C (11.7)

1910.720	213°.20	69″.72
.739	212.90	69.48
.760	212.93	69.29
1910.74	213.01	69.50

Third star measured to show whether there is any proper motion in B.

1999. H 2217. (12.3...13.0)

R. A. $3^h 55^m 15^s$ Decl. + 52° 18′

1910.818	287°.8	7″.43

H 2217 is in the *sf* part of *h* 310, which Herschel calls a "curious knot of stars." There are several small pairs here; the one measured corresponds in all respects to the description in H.

2008. Espin 55. (8.3...12.9)

R. A. $3^h 56^m 12^s$ Decl. + 58° 58′

1909.742	265°.3	9″.91
.744	264.0	10.21
.780	264.0	10.40
1909.76	264.4	10.17

2013. 36 *Tauri.* β 544. (6.0...12.5)

R. A. $3^h 57^m 11^s$ Decl. + 23° 46′

1908.785	258°.4	26″.02
.824	258.2	25.36
.826	258.0	26.11
.882	257.4	25.52
1908.83	258.0	25.75

It is probable that the companion does not share in the small proper motion of A.

Auwers	0″.012	in	214°.5
Boss	0.022	in	190.6

2014. Σ 485. (6.1...6.2)

R. A. $3^h\ 57^m\ 18^s$ Decl. + 62° 0′

A and *a* (13.1)

1910.678	256°.7	6″.99
.681	256.9	6.65
.701	256.3	6.36
1910.69	256.6	6.67

A and *b* (12.7)

1910.678	359°.9	11″.10
.681	358.1	11.01
.701	359.1	10.93
1910.69	359.0	11.01

A and *c* (13.2)

1910.678	132°.8	14″.44
.681	130.4	14.32
.701	129.7	14.42
1910.69	131.0	14.39

These small companions are not in Σ. The large stars not given in Boss' *General Catalogue.*

A and *d* (9.4)

1910.666	76°.63	139″.09
.678	76.80	138.60
.681	76.77	138.79
1910.67	76.73	138.83

For this we have only:

1881.48	76°.12	139″.31	2n	Bl.

These stars are in the brilliant Herschel cluster, VII. 47.

2022. OΣ 71. (7.0...9.0)

R. A. $3^h\ 59^m\ 16^s$ Decl. + 33° 7′

A and C (12.5)

1908.843	119°.5	35″.27
.882	119.5	35.00
.884	118.6	35.22
1908.87	119.2	35.16

No proper motion in AB.

2028. S 443. (9.0...9.9)

R. A. $3^h\ 59^m\ 49^s$ Decl. + 14° 2′

A and B

1908.920	110°.20	42″.07
8.974	109.55	42.32
9.071	109.68	41.82
1908.99	109.81	42.07

A and C (8.0)

1908.920	304°.98	184″.83
8.974	305.15	184.92
9.071	305.13	184.89
1908.99	305.09	184.88

The A. G. positions of A and C give 303°.0: 183″.6 (1875). The three stars are W′ III. 1133, 1135 and 1127; the relative positions in that catalogue are inconsistent with other observations.

2040. Σ 495. (6.0...8.8)

R. A. $4^h\ 0^m\ 54^s$ Decl. + 14° 50′

1906.796	219°.4	4″.13
.813	220.1	3.70
.964	223.2	3.96
1906.86	220.9	3.93

Probably unchanged. No proper motion found for the large star. Not in Boss' *General Catalogue.*

2073. μ *Persei.* OΣ 73. (4.5...12.0)

R. A. $4^h\ 6^m\ 5^s$ Decl. + 48° 6′

A and C (10)

1908.709	231°.75	84″.34
.711	231.62	84.14
.728	231.95	84.33
1908.72	231.77	84.27

The proper motion of the large star is small:

Auwers	0″.028	in	198°.5
Newcomb	0.033	in	151.2
Boss	0.030	in	154.3

2081. β 1278. (6.5...13.7)

R. A. $4^h\ 7^m\ 0^s$ Decl. + 8° 35′

A and C (12.5)

1908.884	253°.39	54″.73
9.763	253.23	54.90
9.838	253.10	55.15
1909.49	253.24	54.93

No proper motion found for the large star.

2102. 39 *Eridani.* Σ 516. (6.0...9.0)

R. A. $4^h\ 8^m\ 41^s$ Decl. — 10° 33′

A and C (10.6)

1911.775	159°.15	149″.15
.813	159.30	148.87
.832	159.40	148.58
1911.81	159.28	148.87

The large stars have a common proper motion. No change in AB. No other measures of the small star.

Auwers	0″.164	in	193°.0
Boss	0.157	in	184.0
Newcomb	0.151	in	184.6

2103. OΣ (App.) 44. (6.2...7.2)

R. A. $4^{h}\,8^{m}\,42^{s}$ Decl. + 45° 55′

1908.709	322°.05	58″.35
.711	322.00	58.29
.728	321.95	58.19
1908.72	322.00	58.28

No relative motion since 1875.

2106. H VI. 98. (6.2...6.7)

R. A. $4^{h}\,9^{m}\,7^{s}$ Decl. + 5° 55′

A and B

1907.845	315°.23	64″.74
.865	315.15	64.85
.879	315.23	64.91
1907.86	315.20	64.83

These measures give a smaller distance. The meridian positions in A. G. Leip. give:

1884.0	315°.3	64″.9

The proper motion of A is given:

Bossert	0″.175	in	210°.8
Porter	0.169	in	221.4

A and C

1907.865	47°.42	215″.78
.879	47.45	215.67
.974	47.43	215.57
1907.91	47.43	215.67

The A. G. Leip. relation is:

1885.3	47°.4	213″.3

implying a proper motion for A of 0″.115.

C and D (9.3...9.4)

1907.865	138°.40	52″.71
.879	138.85	52.64
.974	138.75	52.83
1907.91	138.67	52.73

C and D are DM (5°) 616 and 617. Repeating the measures of these stars after a proper interval of time will furnish an accurate and independent value of the proper motion of AB.

2109. 40 *Eridani*. Σ 518.

R. A. $4^{h}\,9^{m}\,52^{s}$ Decl. — 7° 47′

A and *a* (11.0)

1907.810	51°.43	113″.67
7.845	51.20	113.76
7.865	51.28	113.89
8.000	51.60	114.87
8.022	51.33	114.67
1907.91	51.37	114.17

A and *b* (11.5)

1907.845	7°.93	210″.81
7.865	7.93	210.53
8.000	8.12	211.09
8.022	8.20	211.43
1907.93	8.05	210.96

The most probable value of the proper motion of the large star from the ten sets of measures of A*a* and three of A*b* (1850-1907) is as follows:

A*a*	R. A. — 2″.235	Decl. — 3″.411
A*b*	2.247	3.409

Taking the mean, the corrected proper motion of 40 *Eridani* is:

4″.080 in 213°.3

Other values from meridian positions are:

Auwers	4″.054	in	211°.9
Porter	4.108	in	212.6
Kustner	4.082	in	212.9
Newcomb	4.081	in	212.7
Boss	4.082	in	212.7

B and C

1907.675	44°.9	2″.62
.810	42.0	2.43
.845	44.2	2.51
.865	44.2	2.40
1907.80	43.8	2.49
1908.709	42°.2	2″.65
.750	40.4	2.62
.824	45.3	2.47
.884	43.3	2.73
.974	41.8	2.36
1908.83	42.6	2.57

2116. OΣ (App.) 46. (7.0...7.3)

R. A. $4^{h}\,11^{m}\,25^{s}$ Decl. + 55° 14′

1907.578	159°.57	98″.93
.581	159.80	98.86
.638	159.75	99.10
1907.60	159.71	98.96

A and *a* (12.0)

1907.581	188°.6	33″.67

No relative motion.

The proper motion of A is given:

A. G. Harv.	0″.09	in	180°

2121. S 445. (6.5...7.2)

R. A. $4^{h}\,11^{m}\,56^{s}$ Decl. + 49° 58′

A and B

1907.578	327°.25	73″.75
.581	327.47	73.56
.638	327.55	73.92
1907.60	327.42	73.74

The four positions (1841-1907) give for the relative motion of A:

0″.027 in 310°.2

As B is nearly 7 m, this motion, wholly or in part, may belong to that star. To determine that hereafter, I have measured a third small star:

A and C

1907.578	260°.70	150″.36
.581	260.87	150.67
.638	260.88	150.33
1907.60	260.82	150.45

2126. Σ 523. (7.2...9.2)

R. A. $4^h\ 12^m\ 34^s$ Decl. + 23° 27′

A and B

1908.613	162°.3	10″.37
.633	162.9	10.36
.636	162.2	10.36
1908.63	162.5	10.36

A and C (8.0)

1908.613	48°.23	108″.49
.633	48.03	108.48
.636	48.20	108.38
1908.63	48.15	108.45

The only other measure of the distant star is:

1893.03	48°.13	109″.11	2n	Gla

2128. OΣ (App.) 49. (7.0...7.2)

R. A. $4^h\ 12^m\ 41^s$ Decl. + 1° 29′

1911.931	144°.70	102″.91
11.942	144.63	103.07
12.008	144.58	103.38
1911.96	144.63	103.12

These nearly equal stars have the same proper motion, if any. There is no third star for comparison.

2134. 55 *Tauri.* OΣ 79. (7.0...8.8)

R. A. $4^h\ 13^m\ 3^s$ Decl. + 16° 14′

1908.709	308°.0	0″.27

The proper motion of the binary system is given:

Auwers	0″.107	in	106°.4
Weersma	0.095	in	103.4

This belongs to Boss' group of *Taurus* stars with common proper motion.

2143. Knott 2. (9.6...9.6)

R. A. $4^h\ 14^m\ 49^s$ Decl. + 19° 32′

1907.022	202°.4	2″.75
.102	205.2	3.20
.118	205.0	2.90
1907.08	204.2	2.95

This star has been thought to be variable.

When the foregoing measures were made, Hind's variable nebula, which is about 20′ *s*, was examined and found to be still invisible. In 1890 the nebula was very plain with the 36-inch at the Lick Observatory, with a length of 4″ or 5″ in the direction of about 150° (*Monthly Notices* LI, 94). The 9.4 m star, DM (19°) 705, is in the centre. This may be only the nucleus of the nebula. The magnitude now is about 10.8. The faint nebula in the field *sp*, photographed by Keeler with the 3-foot reflector (*Monthly Notices* LX, 424) was not seen. This is too faint to be visible with the largest apertures except under the most favorable conditions. Nothing seems to be known as to the period of Hind's nebula. (See *Pub. L. O.* II p. 175.)

The 8.7 m star, DM (19°) 704, which was connected by measures with the nebula in 1890, has a small companion:

1907.102	40°.0	59″.39
.118	40.7	59.04
1907.11	40.3	59.21

2150. Ho 329. (6.0...13)

R. A. $4^h\ 15^m\ 19^s$ Decl. — 0° 23′

A and B

1909.091	64°.0	35″.74
.703	63.5	35.83
1909.40	63.7	35.78

As A and B appear to have a common proper motion, I have measured a third star.

Porter 0″.138 in 195°.7

A and C (11.0)

1909.071	279°.40	198″.11
.091	279.20	197.82
.703	279.28	197.41
1909.29	279.29	197.78

h 313 is about 40′ distant *sp* Ho 329.

h 313 and DM (— 1°) 617

1909.785	241°.7	172″.23
.838	242.6	172.15
1909.81	242.1	172.19

2158. Σ 537. (8.1...11.2)

R. A. $4^h\ 16^m\ 21^s$ Decl. — 10° 14′

1908.750	342°.0	16″.43
.824	341.6	16.25
.884	342.1	16.52
1908.82	341.9	16.40

The five positions by Σ, Δ and β (1832-1908) give for the proper motion of A:

0″.040 in 209°.7

2160. Σ 533. (6.0...7.5)

R. A. $4^h\ 16^m\ 37^s$ Decl. + 34° 2′

A and B

1908.613	60°.83	19″.54
.633	60.45	19.50
1908.62	60.64	19.52

A and C (10.8)

1908.597	191°.33	109″.66
.613	191.13	109.59
.633	191.13	109.89
1908.61	191.20	109.71

No change in AB since 1831. The only other measure of the distant star is:

1880.47	189°.93	110″.85	2n	Bl

No proper motion found for the large star.

2162. 62 *Tauri.* Σ 534. (6.2...8.0)

R. A. $4^h\ 16^m\ 45^s$ Decl. + 24° 1′

B and C (11.4)

1911.755	336°.33	110″.33
.775	336.33	110.36
.777	336.27	110.79
1911.77	336.31	110.49

For the proper motion of AB. The proper motion of 62 *Tauri,* which is that of the Struve companion, is given:

Auwers	0″.020	in	187°.8
Boss	0.029	in	142.3

2163. 56 *Persei.* OΣ 81. (6.0...8.8)

R. A. $4^h\ 16^m\ 51^s$ Decl. + 33° 41′

1908.652	36°.3	4″.32
.671	36.8	4.49
.689	38.0	4.42
.709	39.1	4.49
1908.68	37.5	4.43

There is retrograde motion in angle, with no sensible change in the distance.

The proper motion of 56 *Persei* is:

Auwers	0″.077	in	158°.2
Boss	0.093	in	152.0

2166. Doolittle 7. (9.5...10.0)

R. A. $4^h\ 16^m\ 59^s$ Decl. + 33° 36′

A and B

1908.671	212°.0	46″.71
.689	212°.0	46.22
.750	211.9	46.82
1908.70	212.0	46.58

B and C (10.5)

1908.671	216°.1	3″.01
.750	218.4	2.57
1908.71	217.2	2.79

The only other measures are given in Part I of the *General Catalogue.*

2183. δ *Tauri.* H VI. 101. (4.4...9.0)

R. A. $4^h\ 18^m\ 33^s$ Decl. + 17° 38′

1907.673	233°.2	77″.19
.675	233.3	76.81
.692	233.4	77.23
.711	233.3	77.02
1907.69	233.3	77.06

The proper motion seems to belong to both stars.

Auwers	0″.096	in	106°.4
Newcomb	0.112	in	105.5
Boss	0.110	in	103.1

2193. Σ 538.

R. A. $4^h\ 19^m\ 17^s$ Decl. + 63° 58′

About 40′ directly *n* of Σ 538 is the comet-like nebula, II. 768, extended in 110°.

Dreyer 1569 and star 9.5 m

1909.722	1°.4	50″.26
.725	1.6	50.36
.763	1.1	50.06
1909.74	1.4	50.23

The comparison star is DM (64°) 450. Eng. gives Δ Decl. 52″.4 (1884.17).

Dreyer 1569 and star 12.4 m

1909.722	110°.3	87″.5
.725	109.3	84.8
.763	108.9	85.9
1909.74	109.5	86.1

For the last we have:

1884.17	106°.8	85″.2	1n	Eng.

2198. Σ 547. (8.5...11.5)

R. A. $4^h\ 19^m\ 48^s$ Decl. — 1° 40′

1906.890	55°.1	1″.82
.906	57.0	1.83
.964	58.1	1.84
1906.92	56.7	1.83

1908.709	60°.1	1″.96
.750	58.6	1.92
.824	60.6	1.79
.974	61.9	1.80
1908.81	60.3	1.87

The proper motion of A given in the *General Catalogue* from the measures of AB (1831-1902) will not be sensibly changed by the later positions:

0″049 in 315°0

A and DM (— 1°) 641

1906.890	258°4	211″24
.906	258.3	211.09
.964	258.5	211.15
1906.92	258.4	211.16

A comparison of this position with Lamont and A. G. indicates a proper motion of 0″061 in declination for one of the stars. The 7.6 m comparison star has a 13 m companion:

1906.964	233°1	26″09

2201. Σ 545. (7.5...9.3)

R. A. 4ʰ 20ᵐ 8ˢ Decl. + 17° 56′

1910.895	57°8	18″63
.931	58.6	18.33
.933	57.4	18.78
1910.92	57.9	18.58

Perhaps a little diminution in distance. The proper motion of A is given:

Weersma	0″021	in	241°7

2210. Σ 548. (6.0...8.0)

R. A. 4ʰ 21ᵐ 18ˢ Decl. + 30° 6′

A and C

1908.597	195°23	121″29
.613	195.00	121.14
.633	195.03	121.28
1908.61	195.09	121.24

C and *c* (10.3...13.0)

1908.597	52°3	16″67
.633	51.7	16.48
1908.61	52.0	16.58

The other measures of the distant star are:

1880.50	194°35	121″55	2n	Bl
1893.02	194.34	121.03	2n	Gla.

No proper motion found for the large star.

2220. 1 *Camelop.* Σ 550. (5.1...6.2)

R. A. 4ʰ 22ᵐ 32ˢ Decl. + 53° 39′

A and B

1908.597	307°0	10″22
.613	306.5	10.18
.633	307.5	10.16
1908.61	307.0	10.19

B and C (10.5)

1908.597	215°38	149″78
.613	215.10	150.00
.633	214.97	149.90
1908.61	215.15	149.89

Earlier measures of the distant star are:

1879.48	214°58	150″17	2n	Bl.

No change in AB. The proper motion of the large star is small:

Auwers	0″017	in	122°3
Boss	0.008	in	128.8
Newcomb	0.022	in	37.0

2230. 80 *Tauri.* Σ 554. (6.5...9.0)

R. A. 4ʰ 23ᵐ 17ˢ Decl. + 15° 23′

1908.709	41°2	0″62
.824	36.8	0.76
1908.77	39.0	0.69

The proper motion of 80 *Tauri* is:

Auwers	0″072	in	93°2
Newcomb	0.087	in	97.3
Boss	0.106	in	96.5

2232. Σ 556 *rej.* (9.5...9.5)

R. A. 4ʰ 23ᵐ 50ˢ Decl. + 5° 2′

1906.796	289°6	4″28
6.890	288.5	4.27
7.022	289.7	3.96
1906.90	289.3	4.17

The only other measure is on a single night.

2237. H 1146. (8.2...10.3)

R. A. 4ʰ 24ᵐ 39ˢ Decl. 71° 13′

1907.711	40°7	26″31
.791	38.9	26.05
.807	40.2	25.96
1907.77	39.9	26.11

No early measures of this.

2239. 57 *Persei.* Sh 44. (5.2...6.2)

R. A. 4ʰ 24ᵐ 58ˢ Decl. + 42° 48′

A and B

1908.652	198°25	115″56
.671	198.52	115.48
.673	198.56	115.37
1908.67	198.44	115.47

B and C (12.5)

1908.671	314°.83	51″.32
.692	314.13	51.44
1908.68	314.48	51.38

A and C

1908.671	224°.93	103″.86
.692	224.45	103.52
1908.68	224.69	103.69

A and D (11.2)

1908.671	353°.87	76″.41
.673	353.85	76.60
.692	354.23	76.22
1908.68	353.98	76.41

These measures continued will show the separate proper motions of the large stars.

We have for the proper motion of the larger star:

Auwers	0″.007	in	221°.5
Newcomb	0.014	in	73.3
Boss	0.007	in	81.4

The motion of B is given:

Auwers	0″.070	in	155°.7
Boss	0.075	in	165.6

2244. Σ 560 *rej.* (6.8...9.5)

R. A. $4^h 25^m 53^s$ Decl. — 13° 54′

1906.796	44°.0	29″.39
6.890	44.2	29.40
7.022	43.3	29.46
1906.90	43.8	29.42

No early measures of this.

2247. Hd —

R. A. $4^h 26^m 11^s$ Decl. + 1° 2′

h 318 and star 11.6 m

1908.974	61°.1	60″.9
9.706	62.6	61.5
9.722	62.3	62.0
1909.47	62.0	61.5

This is about ½° *sp* the Hd pair; and more distant are two other nebulae.

h 316 and *h* 317

1908.974	81°.0	59″.2
9.706	79.2	57.9
9.722	79.3	59.1
1909.47	79.8	58.7

A prior position is:

1887.08	78°.1	57″.6	in	Eng.

2248. H VI. 64. (6.0...9.4)

R. A. $4^h 26^m 27^s$ Decl. — 3° 28′

1911.775	117°.43	124″.55
.796	117.47	124.31
.813	117.33	124.53
1911.79	117.41	124.46

The only other measures are my own of late date. *h* 320 is 2^m *f* and 4′ *n;* small, and a little brighter in the center; no good comparison star. I do not find any proper motion for the large star which is 5.6 m in SD.

2269. Σ 570. (7.0...8.0)

R. A. $4^h 29^m 31^s$ Decl. — 9° 59′

1908.709	259°.8	12″.84
.750	259.6	12.85
.824	259.3	12.78
1908.76	259.6	12.82

No relative motion since 1830.

2277. Σ 571. (6.3...11.0)

R. A. $4^h 30^m 3^s$ Decl. — 3° 51′

A and C (12.6)

1909.760	199°.18	45″.81
.763	199.82	44.78
.780	199.60	44.76
1909.77	199.53	45.12

A and D (12.6)

1909.760	273°.65	60″.02
.763	273.92	59.01
.780	273.75	59.61
1909.77	273.77	59.55

A and SD (3°) 832

	Δ R. A.	Δ Decl.	
1891	+ 13s.45	+ 274″.3	A. G. Stras.
1909	13.37	274.4	β

The proper motion of the principal star (Bradley 635) is small:

Auwers	0″.039	in	255°.0
Boss	0.044	in	223.1

h 320 and star 13.0 m

1909.760	195°.3	115″.02
.763	195.5	114.28
.780	196.3	114.27
1909.77	195.7	114.52

This is about 30′ *nf* Σ 571.

2279. *2 Camelopardali.* β 1295. (5.0...7.0)

R. A. 4ʰ 30ᵐ 27ˢ Decl. + 53° 14′

AB and D (13.2)

1911.720	214°.9	22″.78
.775	215.5	22.77
.777	215.1	22.34
1911.76	215.2	22.63

From the three β positions of the faint star, each on 3 n (1888-1911) the proper motion of A is:

0″.106 in 144°.8

Some of the values from the catalogues are:

Auwers	0″.100	in	155°.0
Porter	0.100	in	153.2
Boss	0.112	in	143.2

2285. OΣ (App.) 53. (7.0...7.2)

R. A. 4ʰ 31ᵐ 16ˢ Decl. + 0° 20′

1906.796	172°.4	77″.71
.890	172.6	78.01
.906	172.4	77.81
1906.86	172.5	77.84

Without material change.

2296. Σ 575. (8.8...9.8)

R. A. 4ʰ 32ᵐ 32ˢ Decl. — 0° 38′

1911.870	159°.0	5″.00
12.046	159.3	4.74
12.066	159.3	5.11
1911.99	159.2	4.95

No material change since 1831.

h 321, which is about 30′ distant *np* Σ 575, is in the field, closely *p* the 8.3 m star, DM (—0°) 730; too indefinite for accurate measures.

2304. H 346. (6.1...11.0)

R. A. 4ʰ 33ᵐ 49ˢ Decl. + 28° 23′

1911.663	54°.78	43″.19
.755	54.63	43.34
.775	54.57	43.32
1911.73	54.66	43.28

No apparent change in ten years. The proper motion of A is given:

Boss 0″.060 in 134°.0

2312. Σ 583. (7.8...9.4)

R. A. 4ʰ 34ᵐ 45ˢ Decl. + 0° 44′

A and B

1907.675	326°.7	5″.65
.692	326.2	5.73
.772	325.8	5.66
1907.71	326.2	5.68

A and C (9.6)

1907.675	264°.80	99″.56
.692	264.97	99.39
.772	264.60	99.54
1907.71	264.79	99.50

No certain change. The distance of C by South is too large.

2313. *τ Tauri.* S 455. (5.0...7.2)

R. A. 4ʰ 35ᵐ 2ˢ Decl. + 22° 44′

1909.627	212°.76	62″.60
.640	212.55	62.55
.666	213.03	62.55
1909.64	212.78	62.57

No relative change in these stars. There is but little doubt that the principal star is a close pair. A recent examination of the Lick Observatory observing books shows that eleven years before the occultation referred to, I observed this star with the 12-inch, Oct. 11, 1888, and entered it as a close pair, but it was forgotten, and apparently not looked at again. No elongation was noticed at the time of the measures given here. The proper motion of *τ Tauri* is given:

Auwers	0″.016	in	237°.0
Newcomb	0.022	in	153.9
Boss	0.023	in	165.9

2315. H 348. (6.3...10.6)

R. A. 4ʰ 35ᵐ 15ˢ Decl. + 33° 42′

1910.950	285°.3	30″.31
11.008	285.5	29.82
11.622	284.3	30.21
1911.19	285.0	30.11

No early measures.

2322. A. G. 81. (9.5...9.5)

R. A. 4ʰ 36ᵐ 18ˢ Decl. + 6° 16′

1906.796	281°.8	37″.12
.964	282.4	37.33
1906.88	282.1	37.22

2325. Espin 13. (7.4...13)

R. A. 4ʰ 36ᵐ 48ˢ Decl. + 43° 34′

1910.760	218°.2	16″.16
10.931	215.8	16.30
11.775	215.7	15.83
1911.15	216.6	16.10

Disagrees with the former measures in distance. There is a still fainter companion 14 m about the same distance:

1910.760	348°.5	15″.84
11.775	347.1	16.24
1911.27	347.8	16.04

2330. 55 *Eridani.* Σ 590. (6.2...6.7)

R. A. 4ʰ 37ᵐ 50ˢ Decl. — 9° 1′

1910.895	317°.4	9″.29
.931	317.7	9.31
1910.91	317.5	9.30

h 329 is about 15′ distant *nf;* small and faint; near 56 *Eridani.*

56 *Eridani* and *h* 329

1910.895	109°.5	290″.1
.931	109.8	291.9
1910.91	109.6	291.0

The proper motion of 55 *Eridani* is given:

Auwers	0″.024	in	205°.2
Boss	0.044	in	126.2

2333. Σ 584. (7.5...10.2)

R. A. 4ʰ 38ᵐ 8ˢ Decl. + 66° 19′

1907.578	122°.2	12″.00
.581	122.0	11.99
.638	121.4	11.96
1907.60	121.9	11.98

Unchanged.

2339. A. G. 82. (9.4...9.6)

R. A. 4ʰ 38ᵐ 48ˢ Decl. + 66° 24′

1906.813	121°.6	26″.03
7.581	121.3	26.54
7.638	121.2	26.60
1907.34	121.4	26.39

No motion.

2346. H 27. (9.4...9.5)

R. A. 4ʰ 39ᵐ 37ˢ Decl. — 5° 27′

1910.678	51°.07	39″.44
.701	51.10	39.59
.720	50.83	39.05
1910.70	51.00	39.36

No other measures. These stars are SD (5°) 1020 and 1021. *h* 330 is about 5′ *nf* H 27; has no very definite central condensation.

h 330 and SD (5°) 1024

1910.678	353°.5	191″.1

2357. Σ 598. (8.2...9.7)

R. A. 4ʰ 41ᵐ 37ˢ Decl. + 17° 36′

1907.675	316°.9	9″.34
.772	316.9	9.50
.845	316.7	9.31
1907.76	316.8	9.38

No change since 1828.

2358. H 684. (9.0...10.7)

R. A. 4ʰ 41ᵐ 51ˢ Decl. + 10° 43′

A and B

1909.859	263°.8	24″.07
09.933	264.2	24.33
10.678	263.7	24.16
1910.16	263.9	24.19

A and C (10.2)

1909.859	210°.6	46″.69
10.049	211.2	46.16
10.678	211.2	46.54
1910.20	211.0	46.46

C and D (11.2)

1909.859	307°.8	10″.45
09.933	307.5	10.55
10.678	306.8	10.63
1910.16	307.4	10.54

A and DM (10°) 637

1909.859	239°.47	77″.74
09.933	239.36	77.68
10.678	239.40	77.72
1910.16	239.41	77.71

No other measures of these stars. They make the principal part of *h* 332; the other stars small and scattered. For the distant star the meridian positions give:

1875	239°.8	77″.9	A. G. Leip.

2363. Σ 599. (8.0...9.3)

R. A. 4ʰ 42ᵐ 24ˢ Decl. + 44° 46′

A and B

1907.638	336°.1	10″.45
.657	336.1	10.55
.791	335.6	10.25
1907.70	335.9	10.42

No change since Σ.

A and C (13.5)

1907.791	29°.6	17″.77

No other measures of C.

2379. H VI. 83. (7.0...8.5)

R. A. $4^h 48^m 50^s$ Decl. + 6° 44′

1912.675	4°.20	95″.58
.755	4.08	95.73
.791	4.18	96.09
1912.74	4.15	95.80

Herschel's distance of 80″.97 in 1783 would seem to be much too large. The only other measure is my own in 1900. Further measures are required to show whether there is any considerable proper motion. The place given in the *General Catalogue* from Herschel is in error; it should be as given here.

2383. β 552. (6.9...10.2)

R. A. $4^h 45^m 4^s$ Decl. + 13° 27′

AB and C (13.0)

1906.796	213°.1	44″.97
.906	212.8	44.93
.964	213.0	45.11
1906.89	213.0	45.00

No sensible proper motion in the close pair.

2415. OΣ 90. (7.0...9.0)

R. A. $4^h 48^m 25^s$ Decl. + 8° 24′

A and B

1909.112	344°.0	1″.90
.128	344.8	1.83
1909.12	344.4	1.86

A and C

1909.071	94°.9	38″.01
.112	95.1	38.24
1909.09	95.0	38.12

C and D (12.2...13.0)

1909.071	320°.5	11″.65
.112	320.1	11.85
1909.09	320.3	11.75

No other measures of the small stars.

Closely preceding this is another pair not previously seen. This is DM (8°) 793; the magnitudes are 8.3 and 13.0.

1909.071	259°.4	2″.73
.112	257.3	2.59
.128	260.3	2.76
1909.10	259.0	2.69

The place of this (1880) is:

R. A. $4^h 46^m 43^s$
Decl. + 8° 21′

2424. H 2243. (10.0...10.0)

R. A. $4^h 49^m 23^s$ Decl. — 5° 2′

1909.722	147°.6	5″.70
.763	148.0	5.48
.780	149.4	5.93
1909.75	148.3	5.70

No other measures. About 25′ distant nearly *f* H 2243 is *h* 336.

h 336 and SD (5°) 1096

1909.722	223°.70	154″.10
.763	223.58	154.29
.780	223.37	155.00
1909.75	223.55	154.46

The only earlier measure is:

1886.97	223°.4	155″.15	in	Lv.

2426. o² *Orionis.* β 553. (5.0...13.5)

R. A. $4^h 49^m 37^s$ Decl. + 13° 19′

1912.675	49°.85	31″.95
.717	49.66	31.58
.755	49.85	31.75
1912.71	49.79	31.76

The proper motion of the principal star is:

Auwers	0″.097	in	241°.9
Boss	0.102	in	233.3

From the four β measures of the faint star on ten nights (1877-1912) the corrected proper motion of o² *Orionis* is:

0″.097 in 248°.3

2432. 62 *Eridani.* Sh 48. (5.6...9.0)

R. A. $4^h 50^m 30^s$ Decl. — 5° 22′

1909.722	74°.57	66″.37
.763	74.58	66.46
.933	74.53	66.20
1909.81	74.56	66.34

The proper motion of 62 *Eridani* is uncertain:

Auwers	0″.018	in	306°.4
Boss	0.010	in	245.9

2433. 99 *Tauri.* β 1045. (6.1...12.3)

R. A. $4^h 50^m 32^s$ Decl. + 23° 46′

A and C (13.0)

1912.755	353°.00	103″.20
.793	353.27	103.84
.810	352.67	103.62
1912.78	352.98	103.55

No other measures of this star. The proper motion of 99 *Tauri* is uncertain:

Auwers	0″.021	in	238°.4
Boss	0.026	in	167.6

The following star (98 *Tauri*) was measured by mistake in the first instance for 99 *Tauri.*

98 *Tauri.* (6.0...13.7)

R. A. $4^h 50^m 49^s$ Decl. + 24° 53′

A and B

1912.791	358°.0	41″.61
.793	356.8	42.19
.810	357.7	41.51
1912.80	357.5	41.77

A and C (10.3)

1912.793	289°.43	94″.46
.810	289.03	94.84
1912.80	289.23	94.65

The proper motion of 98 *Tauri* from the star catalogues is given:

Auwers	0″.051	in	163°.0
Newcomb	0.069	in	152.5
Boss	0.067	in	153.5

2435. ω *Aurigae.* Σ 616. (4.0...7.9)

R. A. $4^h 51^m 6^s$ Decl. + 37° 43′

A and C (11.5)

1912.675	233°.22	164″.48
.695	233.50	164.96
.717	233.58	164.56
1912.69	233.43	164.67

For the proper motion of ω *Aurigae.* In most of the star catalogues this is designated as 4 *Aurigae* only. For the motion we have:

Auwers	0″.099	in	178°.6
Boss	0.115	in	154.4

2442. Σ 624. (8.1...8.6)

R. A. $4^h 51^m 44^s$ Decl. — 5° 56′

1906.796	88°.4	28″.57
.906	88.6	28.44
.928	89.2	28.54
1906.88	88.7	28.52

No change since 1831.

2446. Σ 619. (8.7...8.7)

R. A. $4^h 52^m 5^s$ Decl. + 50° 5′

1907.638	126°.2	4″.61
.657	127.2	4.47
.769	124.5	4.57
1907.69	126.0	4.55

The four sets of measures by Σ, Δ, A and β (1830-1907) give for the apparent motion of B:

0″.024 in 234°.4

This proper motion is as likely to be in one component as the other.

2450. H 2244. (8.6...9.0)

R. A. $4^h 52^m 16^s$ Decl. + 69° 12′

1908.939	165°.35	106″.90
9.589	165.77	106.76
9.666	165.93	106.92
1909.40	165.68	106.86

No early measures. These stars are Groombridge 902 and 903. The proper motions in that catalogue are:

A	0″.024	in	178°.7
B	0.016	in	131.8

2451. Σ 618. (7.0...7.3)

R. A. $4^h 52^m 18^s$ Decl. + 62° 54′

The proper motions are given by Porter:

A	0″.317	in	15°.3
B	0.291	in	23.4

Of course the motions are exactly the same, as there has been no change since 1831.

B and C

1908.939	183°.83	87″.03
9.589	183.88	87.02
9.666	184.05	87.14
1909.40	183.92	87.06

There being no relative motion, I have connected a third star 11.2 m.

2456. Σ 626 *rej.* (8.0...10.5)

R. A. $4^h 53^m 5^s$ Decl. + 10° 13′

1910.666	241°.1	24″.41
.678	241.5	24.12
.720	241.3	23.87
1910.69	241.3	24.13

No early measures for comparison.

2480. 11 *Camelop.* Σ 13, App. I. (5.0...6.0)

R. A. $4^h 55^m 43^s$ Decl. + 58° 48′

B and C

1908.920	18°.65	173″.58
.939	18.18	174.02
.974	18.44	173.84
1908.94	18.42	173.81

C and D (10.4...12.9)

1908.939	8°.8	16″.22
.974	9.3	16.09
1908.96	9.0	16.15

The prior measures are:

1879.16	18°.60	173″.43	in	Bl.
1879.71	17.95	172.59	in	Bl.

B is 12 *Camelopardali*. There is little or no relative change since 1836 and, therefore, the proper motions are really the same.

For A we have:

Auwers	0″.015	in	215°.5
Boss	0.007	in	198.4

For B:

Auwers	0″.012	in	194°.5
Boss	0.039	in	166.2

2495. 9 *Aurigae*. β 1046. (5.5...12.7)

R. A. $4^h 57^m 17^s$ Decl. + 51° 26′

A and C (9.1)

1908.939	60°.65	89″.80
8.974	61.13	89.89
9.071	61.23	89.79
1908.99	61.00	89.83

C and D (13)

1908.974	125°.8	47″.69
9.071	124.8	47.65
1909.02	125.3	47.67

C is DM (51°) 1026. As this appears to be moving with AB, I have connected a fourth star.

The proper motion of A is:

Auwers	0″.169	in	190°.5
A. G. Harv.	0.146	in	192.9
Boss	0.178	in	184.9
Porter	0.171	in	192.3

2515. H 3265. (9.6...9.6)

R. A. $4^h 59^m 55^s$ Decl. + 36° 54′

1910.739	136°.5	15″.12
.760	136.3	15.04
.780	136.9	15.16
1910.76	136.6	15.11

The components of H 3265 are among the brighter stars of *h* 344. The only DM stars are (36°) 1010 and 1012, respectively 9.2 and 9.0 m. There is a 12.5 m star from A, 22°.8: 15″.5. There are other pairs in the group, one of which was measured by mistake for H 3265:

1910.780	62°.9	8″.52

2556. H 3268. (10.6...10.9)

R. A. $5^h 3^m 46^s$ Decl. + 16° 22′

1910.627	267°.6	9″.74
.678	265.0	9.88
.780	266.8	9.67
1910.69	266.5	9.76

The components of H 3268 form a part of *h* 348; mostly small stars. No other measures.

2558. Σ 629. (8.2...11.2)

R. A. $5^h 4^m 4^s$ Decl. + 83° 18′

1907.807	6°.7	15″.70
8.636	7.8	16.01
8.652	6.7	15.74
1908.36	7.1	15.82

The proper motion of the principal star from the five positions by Σ, Δ, OΣ, A and β (1832-1908) is:

Measures	0″.087	in	241°.0
Greenwich	0.054	in	243.4

2568. H 3269. (9.2...11.2)

R. A. $5^h 5^m 4^s$ Decl. + 16° 36′

1910.678	62°.0	19″.82
.780	61.2	19.75
1910.73	61.6	19.78

Closely following H 3269 is *h* 349, with several small pairs, one of which was measured for H 3269:

1910.627	72°.8	23″.47	11.0...11.1

The principal star of H 3269 is DM (16°) 721.

On the night of Nov. 18, 1909, comet Halley passed through *h* 349.

2579. H 2253. (8.3...12.8)

R. A. $5^h 6^m 37^s$ Decl. + 51° 49′

A and B

1908.766	23°.8	26″.10
.769	23.4	26.30
.788	25.0	26.28
1908.77	24.1	26.23

A and C (9.6)

1908.766	10°.9	51″.87
.769	10.6	52.00
.788	10.5	52.25
1908.77	10.7	52.04

The principal star is given a small proper motion:

A. G. Alb.	0″.059	in	90°

2591. 14 *Aurigae.* Σ 653. (5.0...11.0)

R. A. $5^h\ 7^m\ 36^s$ Decl. + 32° 33′

A and B

1908.766	352°.7	11″.19
.769	352.7	10.98
.788	353.8	11.10
1908.77	353.1	11.09

A and C (7.2)

1908.766	225°.2	14″.42
.769	224.4	14.50
.788	224.5	14.67
1908.77	224.7	14.53

A and D (10.3)

1908.747	320°.97	184″.14
.766	320.78	183.97
.769	320.53	183.73
1908.76	320.76	183.95

The only prior observation of the distant star is:

1880.50	320°.43	184″.52	2n	Bl.

According to Auwers the proper motion of the large star is nearly all in Decl.; while the measures of AB and AD agree in placing it principally in RA. A continuation of these positions should give the real motion, which is certainly much larger than the meridian value.

Measures of AB	0″.040	in	291°.6
Measures of AD	0.042	in	258.5
Auwers	0.014	in	334.1
Boss	0.015	in	305.4

2597. α *Aurigae.* H VI. 30

R. A. $5^h\ 7^m\ 49^s$ Decl. + 45° 53′

A and F (10.0)

1911.793	144°.43	145″.76
.813	144.57	145.80
.832	144.37	145.98
.835	144.10	146.03
.870	144.38	145.64
1911.83	144.37	145.84

This position when compared with that of OΣ from measures on 27 n (1854-1911) should give the proper motion of the bright star with the highest degree of accuracy.

0″.414 in 165°.6

This will be confirmed later when the nearer and fainter stars are sufficiently measured.

Auwers	0″.435	in	170°.3
Newcomb	0.438	in	168.0
Boss	0.437	in	168.7

2605. β *Orionis.*

R. A. $5^h\ 8^m\ 47^s$ Decl. — 8° 20′

A and D (13.5)

1912.755	0°.07	44″.77
.810	0.40	44.67
.813	1.02	44.71
1912.79	0.50	44.72

From the β measures of the faint star on ten nights (1878-1912) we have for the proper motion of β *Orionis:*

0″.022 in 103°.9

It is not probable that this value will be very materially changed, but the small star is not easy to measure, and the motion is small, and therefore the measures should be continued. The results from meridian observations are singularly discordant in amount as well as direction:

Auwers	0″.018	in	293°.2
Newcomb (F. C.)	0.001	in	97.7
Newcomb (Stand.)	0.007	in	213.3
Boss	0.002	in	124.0

2606. Σ 667. (7.5...9.0)

R. A. $5^h\ 8^m\ 52^s$ Decl. — 7° 13′

1908.750	314°.5	4″.04
11.088	315.0	4.17
1909.92	314.7	4.10

No change.

2627. λ *Aurigae.* Σ 3, App. II. (4.8...13.5)

R. A. $5^h\ 10^m\ 42^s$ Decl. + 39° 59′

A and D (8.7)

1908.709	5°.45	138″.42
.711	5.60	138.35
.728	5.23	138.17
1908.72	5.43	138.31

A and C (12.2)

1908.769	236°.5	34″.17
.824	235.1	33.93
1908.80	235.8	34.05

My three sets of measures of the small star C (1879-1908) give, as they should do, practically the same value of the proper motion of the bright star as that given by the measures of AD:

Measures of AC	0″.852	in	140°.8
Measures of AD	0.856	in	140.6
Auwers	0.833	in	141.9
Newcomb	0.845	in	141.0
Boss	0.843	in	141.1

2634. Σ 678. (8.3...8.8)

R. A. $5^h\ 11^m\ 17^s$ Decl. + 4° 33′

A and B

1908.709	97°2	3″45
.884	99.2	3.35
1908.80	98.2	3.40

A and C (11.0)

1908.709	338°85	75″59
.884	338.40	75.63
.898	338.63	75.14
1908.83	338.63	75.45

No change in the 11 m star since 1893.

2654. A 53. (8.5...12.5)

R. A. $5^h\ 13^m\ 6^s$ Decl. — 3° 12′

A and B

1906.796	46°5	4″30
.906	48.2	4.87
.928	45.9	4.43
.964	46.4	4.61
1906.90	46.8	4.55

A and C (10.1)

1906.928	182°4	196″61
.964	182.4	196.80
1906.95	182.4	196.70

Common proper motion in AB.

Kustner 0″690 in 77°5

Distant star for an independent value.

2658. Σ 684. (8.0...9.8)

R. A. $5^h\ 13^m\ 24^s$ Decl. + 44° 58′

1907.657	139°6	1″41
7.791	137.2	1.62
8.214	140.4	1.37
1907.89	139.1	1.47

No motion.

2660. See 50. (5.0...12.8)

R. A. $5^h\ 13^m\ 30^s$ Decl. — 18° 16′

1907.022	220°0	31″32
8.159	221.6	31.77
8.750	221.7	32.16
1907.98	221.1	31.75

Unfortunately the original position of 1897 depends upon a single night, and therefore cannot be safely used with regard to relative motion. If this measure is correct, the large star has a proper motion of 1″161 in 106°7, which is more than three times the movement from meridian positions of 0″356 in 90°. Another set of measures a few years hence will settle the matter. There is a third 14.5 m star about the same distance from A; BC = 99°4 : 14″.

2680. Σ 691. (8.5...9.0)

R. A. $5^h\ 15^m\ 21^s$ Decl. + 31° 3′

1908.747	300°2	25″66
.750	299.8	25.56
.766	300.0	25.47
1908.75	300.0	25.56

No other measures since 1866.

2690. *σ Aurigae.* β 888. (6.0...12.0)

R. A. $5^h\ 16^m\ 30^s$ Decl. + 37° 16′

A and B

1908.750	165°5	8″59
.769	165.7	8.59
.974	166.8	8.46
1908.83	166.0	8.55

The small star appears to be moving with the other, if there is any proper motion. The meridian positions prove nothing.

Auwers	0″027	in	272°2
Boss	0.027	in	182.5

2699. Σ 698. (6.2...7.7)

R. A. $5^h\ 17^m\ 14^s$ Decl. + 34° 45′

1908.766	346°9	31″22
.824	346.4	31.09
.843	346.9	31.08
1908.81	346.7	31.13

Not fully measured since 1866.

2704. Σ 699. (7.3...8.0)

R. A. $5^h\ 17^m\ 26^s$ Decl. + 37° 56′

1908.788	343°7	8″65
8.845	344.5	8.72
9.109	344.0	8.85
1908.91	344.1	8.74

Probably unchanged.

2727. S 483. (7.0...8.6)

R. A. $5^h\ 20^m\ 9^s$ Decl. + 33° 41′

A and B

1907.848	50°82	96″02
8.025	50.38	96.01
8.044	50.50	95.96
1907.97	50.57	96.00

A and C (10.5)

1907.848	340°.92	103″.48
8.025	340.77	103.23
8.044	340.87	103.49
1907.97	340.85	103.40

A and D (10.5)

1907.848	318°.63	108″.42
8.025	318.77	108.33
8.044	319.10	108.93
1907.97	318.83	108.56

B and *b* (13.5)

1907.848	349°.8	15″.68

The proper motion of A, derived from the several measures of B, C, and D, is as follows:

AB	R. A. — 0″.051	Decl. — 0″.194
AC	0.033	0.207
AD	0.057	0.204
	— 0.047	— 0.202

Therefore the corrected movement of the principal star is:

0″.207 in 193°.1

From the star catalogues:

Stumpe	0″.192	in	204°.2
Porter	0.171	in	180.0
Kustner	0.182	in	187.9

2729. 115 *Tauri.* OΣ 107. (6.0...10.8)

R. A. $5^h 20^m 10^s$ Decl. + 17° 51′

A and B

1908.769	306°.1	9″.92
9.109	307.1	10.09
1908.94	306.6	10.00

A and C (12.5)

1908.769	339°.4	9″.55
9.109	342.1	9.73
1908.94	340.7	9.64

The proper motion of A is doubtful:

Boss	0″.016	in	148°.5
Auwers	0.016	in	259.2

2732. H 699. (10.8...11.2)

R. A. $5^h 20^m 21^s$ Decl. + 35° 16′

1911.720	215°.4	9″.81
.736	215.7	9.72
1911.73	215.5	9.76

No other measures. H 699 is in the field with, and closely following, *h* 354.

2738. Σ 704. (7.2...9.5)

R. A. $5^h 20^m 48^s$ Decl. + 69° 34′

1912.638	15°.3	20″.29
.675	14.8	20.38
.678	15.0	20.25
1912.66	15.0	20.31

No proper motion found for the principal star in the several catalogues examined. This is given from the measures of the small star with a high degree of accuracy. The four sets of measures by Σ, Δ and β on 13 n (1831-1912) give for this motion:

0″.084 in 348°.2

2745. Σ 711. (7.5...9.2)

R. A. $5^h 21^m 38^s$ Decl. + 54° 35′

B and C

1908.613	245°.50	190″.73
.636	245.43	190.66
.671	245.40	190.50
1908.64	245.44	190.63

C and D (10.0...13.1)

1908.636	305°.6	15″.48
.671	309.9	15.37
.689	307.6	15.38
.750	306.8	15.19
1908.69	307.5	15.35

The large common proper motion of A and B is well known. Of the other stars the only prior measure is:

1881.46 243°.00 197″.08 2n Bl.

The two positions give for the annual motion of AB:

0″.386 in 192°.3

Further measures are needed before this can be substituted for the meridian value.

Some of the prior values are:

Porter	0″.434	in	200°.9
Kustner	0.425	in	198.3

The small star C is an exceedingly difficult and close pair. On only one night could it be seen well enough to properly measure.

C and *c* (10.5...10.7)

1908.750	173°.6	0″.59

2751. 118 *Tauri.* Σ 716. (5.8...6.6)

R. A. $5^h 21^m 53^s$ Decl. + 25° 3′

A and C (12.0)

1912.675	98°.25	141″.90
.695	99.15	141.47
.717	99.06	140.51
1912.69	98.82	141.29

Very little change in the large stars. For the proper motion of A we have:

Auwers	0″.019	in	163°.2
Boss	0.040	in	149.1

2764. H 701. (7.2...10.9)

R. A. 5ʰ 22ᵐ 50ˢ Decl. + 31° 25′

1912.675	136°.52	35″.02
.695	136.80	34.82
.717	136.83	35.52
1912.69	136.72	35.12

The only other measure is that given in Part II of the *General Catalogue*.

2770. Σ 718. (7.2...7.2)

R. A. 5ʰ 23ᵐ 7ˢ Decl. + 49° 18′

A and B

1910.605	74°.0	7″.58
.608	74.0	7.62
.627	72.6	7.60
1910.61	73.5	7.60

No sensible change in AB.

A and C (9.6)

1910.605	185°.21	118″.87
.608	185.07	118.47
.627	185.15	119.08
1910.61	185.14	118.81

The only other position of C is:

1881.47	184°.56	119″.98	2n	Bl.

These measures imply a proper motion of A:

0″.055 in 141°.5

If these positions have the usual accuracy, the motion from meridian observations is erroneous:

Groombridge 0″.042 in 224°.4

2809. Espin 63. (8.4...11.8)

R. A. 5ʰ 27ᵐ 15ˢ Decl. + 41° 13′

1907.731	172°.9	8″.02
.769	173.9	8.10
.791	171.6	8.09
1907.76	172.8	8.07

2830. Σ 745. (8.5...8.7)

R. A. 5ʰ 28ᵐ 57ˢ Decl. — 6° 5′

A and B

1912.810	346°.8	28″.73
.813	345.7	28.75
.867	346.7	28.56
1912.83	346.4	28.68

A and C (9.0)

1912.810	288°.93	78″.06
.813	289.22	77.69
.867	289.13	77.79
1912.83	289.09	77.85

No change in AB since 1831. C is SD (6°) 1230; no other measures.

2846. H 3276. (10.5...10.7)

R. A. 5ʰ 29ᵐ 41ˢ Decl. + 16° 59′

1909.859	65°.6	26″.17
09.933	65.6	26.61
10.128	65.3	26.19
1909.97	65.5	26.32

About this time (1909.85) the Halley comet passed very near. There is a large error in the measures of distance in 1904.

2853. Weisse 9. (8.5...9.8)

R. A. 5ʰ 30ᵐ 39ˢ Decl. — 13° 54′

1906.906	151°.9	44″.50
.964	151.8	44.28
1906.93	151.8	44.39

Only recent measures.

2871. Σ 755. (8.3...9.0)

R. A. 5ʰ 31ᵐ 52ˢ Decl. + 23° 13′

A and B

1907.731	316°.1	6″.27
.769	316.5	6.15
.772	314.7	6.02
1907.76	315.8	6.15

No change in these stars.

A and C

1907.769	33°.05	146″.44
.772	33.13	146.51
1907.77	33.09	146.47

C and D (8.0...10.5)

1907.769	176°.12	79″.36
.772	175.80	78.97
1907.77	175.96	79.16

The only prior measures of the distant stars are:

AC	1879.85	34°.3	146″.01	2n	β
CD	1879.85	175.5	79.11	2n	β

2888. H 2274

R. A. $5^h\ 33^m\ 53^s$ Decl. $+ 55°\ 44'$

This could not be identified with absolute certainty. There is no lack of small pairs, but none fully answering the description. H 2274 should be in, or closely preceding, *h* 364.

2901. Σ 771. (9.0...9.2)

R. A. $5^h\ 34^m\ 42^s$ Decl. $+ 19°\ 29'$

1911.947	234°.90	24″.03
12.046	234.60	23.88
1912.00	234.75	23.95

One of these nearly equal stars has a small proper motion. The apparent movement of A from the measures (1829-1912) is:

0″.030 in 240°.8

To show whether or not there is any motion in B, I have connected a 13 m star:

B and C

1911.947	209°.54	100″.43
12.046	209.45	100.49
1912.00	209.50	100.46

2907. Σ 773

R. A. $5^h\ 34^m\ 55^s$ Decl. $+ 33°\ 19'$

A and B (Doolittle)

1910.627	254°.8	19″.84
.931	256.0	20.00
1910.78	255.4	19.92

A and C (Σ 773)

1910.627	218°.5	27″.11
.720	217.4	27.17
.931	219.1	26.70
1910.76	218.3	26.99

No change in AC.

2912. Kr 27. (8.6...10.0)

R. A. $5^h\ 35^m\ 38^s$ Decl. $+ 56°\ 45'$

1907.657	327°.8	2″.09
.731	330.5	2.26
.791	328.5	2.13
1907.73	328.9	2.16

No change since 1890.

2915. Σ 769. (8.0...10.2)

R. A. $5^h\ 35^m\ 45^s$ Decl. $+ 53°\ 16'$

A and C (10.8)

1909.840	95°.90	137″.02
.859	96.17	137.13
.936	95.82	136.54
1909.88	95.96	136.90

The other position is:

1880.60	95°.57	136″.04	3n	Bl.

The proper motion of A is very doubtful.

A. G. Harv. 0″.069 in 360°

2923. Σ 782. (7.8...8.3)

R. A. $5^h\ 36^m\ 47^s$ Decl. $- 0°\ 2'$

A and C (11.1)

1909.859	164°.14	131″.37
10.109	164.45	131.96
10.128	164.50	131.74
1910.03	164.36	131.69

Observed for proper motion of A; no other measures. One of the Struve stars has a motion of about 0″.06.

2924. Σ 779. (8.0...10.0)

R. A. $5^h\ 36^m\ 48^s$ Decl. $+ 27°\ 41'$

A and C (11.7)

1911.947	35°.77	51″.95
11.950	35.70	52.35
12.046	35.20	51.97
1911.98	35.56	52.09

For the proper motion of A; no other measures.

Battermann 0″.033 in 307°.0

2936. OΣ 115. (7.1...7.9)

R. A. $5^h\ 37^m\ 40^s$ Decl. $+ 15°\ 1'$

AB and C (11.0)

1911.775	256°.38	92″.94
.813	256.60	92.82
.835	256.70	92.87
1911.80	256.56	92.88

As the early positions of the faint star depend upon a single night, the deduced motion of AB might be subject to some error. Later measures will correct this.

The proper motion of AB is given:

Porter 0″.035 in 135°.4

2941. Σ 785

R. A. 5ʰ 38ᵐ 29ˢ Decl. + 25° 52′

The pair measured here is the one in the field with Σ 785 observed by Tarrant.

A and B (10.0...11.7)

1911.644	250°.6	6″.17
.720	252.3	5.86
.755	253.3	6.20
1911.71	252.1	6.08

The only other measure is that given in the *General Catalogue.*

A and Σ 785 (A)

1911.644	189°.83	201″.40

2943. Σ 789 *rej.* (7.0...10.0)

R. A. 5ʰ 38ᵐ 42ˢ Decl. + 3° 57′

1911.947	149°.3	17″.46
12.008	149.3	17.50
12.046	149.5	17.04
1912.00	149.4	17.33

The only other measures are of recent date.

2945. Σ 787. (8.1...8.5)

R. A. 5ʰ 38ᵐ 50ˢ Decl. + 21° 16′

A and C (13)

1910.933	38°.2	12″.72
10.971	41.1	12.88
11.720	39.4	12.66
1911.21	39.6	12.75

No other measures of this companion.

2959. 29 *Camelopardali.* H IV. 25. (6.7...9.7)

R. A. 5ʰ 40ᵐ 19ˢ Decl. + 56° 53′

1911.622	130°.3	25″.14
.625	131.2	24.86
.644	130.8	25.00
1911.63	130.8	25.00

The only other measures are of late date. The proper motion is small and uncertain. The measures of the small star should be continued.

Auwers	0″.027	in	244°.0
Boss	0.007	in	145.7

2964. β 559. (9.5...11.5)

R. A. 5ʰ 40ᵐ 36ˢ Decl. + 0° 2′

A and C (9.0)

1909.782	201°.95	50″.59
09.859	202.40	50.31
10.109	201.59	50.56
1909.92	201.98	50.49

This is in *h* 368 (= M 78). No change in AC since 1879. The following, not given in the *General Catalogue,* is derived from Δ R. A. and Decl.:

1891.20	203°.2	51″.36	1n	Eng.

2968. τ *Aurigae.* β 192. (5.0...12.0)

R. A. 5ʰ 40ᵐ 52ˢ Decl. + 39° 8′

A and B

1910.777	352°.35	39″.38
.893	352.21	39.08
.931	352.63	39.56
1910.87	352.40	39.34

A and C (12.0)

1910.720	34°.10	48″.53
.777	33.52	48.21
.835	34.01	48.82
1910.78	33.88	48.52

From the measures of the two companions (1877-1910) we have for the proper motion of the large star:

AB	R. A. — 0″.046	Decl. — 0″.019
AC	— 0.036	— 0.004

Hence the proper motion of τ *Aurigae* is:

0″.042 in 254°.3

From meridian observations:

Auwers	0″.043	in	239°.4
Boss	0.036	in	223.2

2969. 133 *Tauri.* H 3279. (5.4...12.4)

R. A. 5ʰ 40ᵐ 54ˢ Decl. + 13° 51′

A and B

1911.775	297°.5	17″.69
.813	297.8	17.85
.835	297.8	17.84
1911.81	297.7	17.79

A and C (12.2)

1911.775	182°.1	24″.87
.813	183.1	24.80
.835	182.0	24.96
1911.81	182.4	24.88

The proper motion of 133 *Tauri* is too small to be detected, even with the micrometer, in the time involved. The meridian results are still more uncertain.

Auwers	0″.002	in	124°.5
Boss	0.022	in	126.6

2974. β 561. (7.0...13)

R. A. 5ʰ 41ᵐ 18ˢ Decl. + 12° 22′

1909.744	3°.0	19″.05
.818	1.8	19.12
.859	2.8	19.07
1909.81	2.5	19.08

Very little change, if any, since 1878.

2978. Σ 791. (8.7...9.3)

R. A. $5^h\ 41^m\ 42^s$ Decl. + 39° 32′

A and C (10.1)

1909.782	213°.52	60″.72
.818	213.44	60.35
.933	213.06	60.47
1909.84	213.34	60.51

Evidently the Σ star has no sensible proper motion.

1880.54	212°.63	60″.74	2n	Bl.

2981. S 500. (8.5...8.5)

R. A. $5^h\ 41^m\ 53^s$ Decl. + 32° 56′

1911.947	89°.70	59″.76
11.950	89.70	59.91
12.011	89.42	59.88
1911.97	89.61	59.85

No certain relative change. The brilliant cluster, *h* 369, is 2½^m *f* and 25′ *s*.

2984. Σ 796. (6.9...8.0)

R. A. $5^h\ 42^m\ 7^s$ Decl. + 31° 45′

A and C (10.7)

1909.818	324°.50	207″.50
.935	324.35	207.50
.953	324.42	207.61
1909.90	324.42	207.54

No motion.

1880.51	324°.24	207″.48	2n	Bl.

2990. Σ 794. (8.5...10.2)

R. A. $5^h\ 42^m\ 39^s$ Decl. + 48° 42′

B and C (12.0)

1909.782	309°.27	35″.61
.818	309.53	35.29
.933	309.13	35.19
1909.84	309.31	35.36

Probably unchanged.

1880.60	309°.85	36″.14	3n	Bl.

A and DM (48°) 1313

1909.818	259°.13	116″.95
.933	259.04	117.25
1909.88	259.08	117.10

From meridian observations:

1875	258°.3	119″.0	A. G. Bonn.

2996. ν *Aurigae.* H V. 90. (4.2...9.5)

R. A. $5^h\ 43^m\ 10^s$ Decl. + 39° 7′

1910.971	206°.33	54″.58
11.088	206.27	54.72
11.104	205.70	54.49
1911.05	206.10	54.60

Compared with my measure of 1878, the proper motion of the large star is:

0″.020 in 291°.9

The annual change from transit positions is uncertain:

Auwers	0″.030	in	304°.8
Boss	0.007	in	322.2
Newcomb	0.013	in	353.4

3000. H 712. (9.3...9.7)

R. A. $5^h\ 43^m\ 21^s$ Decl. + 6° 3′

The following component is obviously the smallest.

1906.796	82°.5	8″.86
7.022	83.2	8.80
1906.91	82.8	8.83

3006. Σ 802. (7.9...8.5)

R. A. $5^h\ 44^m\ 6^s$ Decl. + 40° 7′

A and C (9.8)

1909.782	57°.50	191″.70
.818	57.50	191.64
.936	57.32	191.57
1909.85	57.44	191.64

No change in AB. C is DM (40°) 1438.

1880.53	58°.31	192″.10	2n	Bl.

3023. OΣ 120 *rej.* (6.7...7.8)

R. A. $5^h\ 45^m\ 52^s$ Decl. + 53° 26′

1907.657	136°.12	44″.97
.711	136.27	44.91
.731	136.55	45.04
1907.70	136.31	44.97

The distance is increasing.
No proper motion found in the catalogues examined.

3029. β 95. (8.0...12.0)

R. A. $5^h\ 46^m\ 9^s$ Decl. — 7° 20′

1911.775	297°.2	14″.02
.832	296.7	13.95
.942	295.6	13.73
1911.85	296.5	13.90

No material change. About 12′ *s* is *h* 370; small, and without any definite nucleus for measurement.

3037. S 502. (7.4...7.8)

R. A. $5^h 47^m 56^s$ Decl. + 13° 50′

1909.744	130°.70	46″.15
.818	130.53	45.96
.821	130.33	45.64
.838	130.70	45.37
1909.81	130.56	45.78

Certainly fixed.

3039. Σ 815. (8.2...10.4)

R. A. $5^h 48^m 12^s$ Decl. + 5° 19′

A and C (11.0)

1908.843	307°.47	87″.80
.884	306.75	88.26
.898	307.43	87.50
1908.87	307.22	87.85

No measures since 1864. Some change in distance is implied, but the early measure is on a single night.

3047. Σ 816. (6.2...8.7)

R. A. $5^h 48^m 30^s$ Decl. + 5° 50′

1906.796	289°.8	4″.50
7.022	290.9	4.30
7.120	291.1	4.31
1906.98	290.6	4.37

No change since Struve.

3048. α *Orionis.*

R. A. $5^h 48^m 40^s$ Decl. + 7° 23′

A and D (13.5)

1911.947	346°.97	76″.24
12.046	346.20	75.97
12.162	346.80	75.84
1912.05	346.66	76.02

From four positions on 11 n by β and Doo (1877-1912), the proper motion of α *Orionis* is:

0″.068 in 39°.3

A continuation of the measures of this and two nearer faint companions will confirm this value.

From meridian observations we have:

Auwers	0″.023	in	27°.5
Newcomb	0.022	in	72.1
Boss	0.029	in	74.2

3064. β *Aurigae.* H VI. 88. (1.8...10.0)

R. A. $5^h 50^m 43^s$ Decl. + 44° 56′

1911.622	39°.55	184″.68
.625	39.45	184.15
.644	39.51	184.99
.663	39.78	184.65
1911.64	39.57	184.62

The measure of 1783 is obviously largely in error. The three positions by β (1879-1911) give for the proper motion of the bright star:

0″.062 in 289°.2

It is not probable that the faint star, B, has any sensible movement. There is no other star near it.

Auwers	0″.060	in	263°.3
Newcomb	0.040	in	261.3
Boss	0.047	in	263.9

3073. β 1055. (6.6...11.5)

R. A. $5^h 51^m 32^s$ Decl. + 44° 35′

A and C (9.2)

1911.931	329°.03	33″.29
11.950	328.68	33.31
12.008	329.20	33.01
1911.96	328.97	33.20

The distant Herschel companion appears to have the same proper motion as the large star. The values of this movement from meridian observation are:

Auwers	0″.058	in	222°.6
Boss	0.051	in	214.5
Kustner	0.057	in	238.6

3074. *θ Aurigae.* OΣ 545. (3.0...7.5)

R. A. $5^h 51^m 32^s$ Decl. + 37° 12′

A and C (10.5)

1910.971	295°.10	47″.60
11.088	295.13	47.22
11.104	295.00	47.66
1911.05	295.08	47.49

A and D (9.5)

1910.971	349°.97	129″.82
11.088	349.75	128.81
11.104	349.70	129.83
1911.05	349.81	129.49

From all the measures of both companions (1840-1911), the corrected proper motion of *θ Aurigae* is:

AC	R. A. + 0″.039	Decl. — 0″.066
AD	0.043	0.076
	+ 0.041	— 0.071

Therefore the annual movement is:

0″.082 in 150°.0

From the star catalogues:

Auwers	0″.090	in	153°.1
Newcomb	0.107	in	148.0
Boss	0.105	in	149.1

3079. 59 *Orionis.* H V. 100. (6.1...9.7)

R. A. 5ʰ 52ᵐ 10ˢ Decl. + 1° 49′

1911.775	204°.53	37″.04
.813	205.33	36.78
.815	205.35	36.79
1911.80	205.07	36.87

The proper motion, if any, is very small and uncertain:

Auwers	0″.015	in	136°.3
Boss	0.013	in	159.4

The measures of the companion show that the principal star has no sensible movement.

3088. S 504. (8.5...8.6)

R. A. 5ʰ 53ᵐ 19ˢ Decl. — 20° 10′

1907.022	70°.0	3″.46

Probably unchanged. The early measure by South is too large in distance.

3090. Σ 825. (7.8...9.0)

R. A. 5ʰ 53ᵐ 30ˢ Decl. + 36° 31′

1907.695	145°.7	7″.89
.731	145.2	8.01
.788	145.2	8.15
1907.74	145.4	8.02

No change.

3093. H IV. 48. (8.6...11.9)

R. A. 5ʰ 53ᵐ 48ˢ Decl. + 23° 20′

A and B

1911.720	259°.0	31″.30
.755	259.3	31.60
.775	258.8	31.21
1911.75	259.0	31.37

The large change in distance apparent from Herschel's measure in 1783 is not likely to be real.

B and C (12.0)

1911.720	207°.3	5″.90
.775	206.2	5.67
1911.75	206.7	5.78

A is the largest star but one in *h* 372; most of the others much smaller.

3095. Σ 827 *rej.* (8.1...10.4)

R. A. 5ʰ 54ᵐ 0ˢ Decl. — 0° 31′

1906.796	222°.1	25″.66
.906	222.0	25.72
.964	222.4	25.91
1906.89	222.2	25.76

No other measures.

3108. Σ 832 *rej.* (9.0...9.9)

R. A. 5ʰ 55ᵐ 38ˢ Decl. — 14° 32′

1906.796	87°.0	24″.06
.906	86.7	24.24
.964	86.8	24.23
1906.89	86.8	24.18

No other measures. There is a 13 m star nearer A:
190°.5 12″.0

3118. Σ 836. (8.3...10.8)

R. A. 5ʰ 56ᵐ 29ˢ Decl. — 2° 22′

1906.906	28°.9	1″.64
7.102	26.2	1.49
7.120	25.0	1.79
1907.04	26.7	1.64

No change.

3123. Σ 834. (8.0...8.8)

R. A. 5ʰ 56ᵐ 52ˢ Decl. + 30° 14′

1907.695	308°.4	22″.96
.788	307.9	23.02
.848	308.0	22.62
1907.78	308.1	22.87

No measures since 1866. Fixed.

3127. Σ 824. (8.0...10.0)

R. A. 5ʰ 57ᵐ 44ˢ Decl. + 76° 32′

1908.769	201°.3	1″.61
10.838	204.2	1.30
10.895	205.7	1.45
1910.17	203.7	1.45

Change in angle? No other measures since 1869.

3130. Σ 831. (8.7...8.7)

R. A. $5^h\ 58^m\ 18^s$ Decl. + 68° 0′

1908.636	75°.7	11″.76
.652	75.7	11.88
.671	75.4	11.77
1908.65	75.6	11.80

No other recent measures.

3135. Skinner 2. (8.2...9.5)

R. A. $5^h\ 58^m\ 43^s$ Decl. — 15° 40′

1906.796	171°.5	5″.14
8.063	172.6	5.32
8.159	172.1	5.24
1907.67	172.1	5.23

The only other measure is that given in Part I of the *General Catalogue*.

3167. Σ 850. (8.5...10.2)

R. A. $6^h\ 1^m\ 24^s$ Decl. — 3° 59′

1906.906	17°.6	1″.88
7.102	20.5	1.98
1907.00	19.0	1.93

No other recent measures.

3171. Σ 848. (7.3...8.0)

R. A. $6^h\ 1^m\ 42^s$ Decl. + 13° 59′

A and C (12.0)

1910.678	296°.6	15″.54
.720	295.3	15.28
.739	295.6	15.20
1910.71	295.8	15.34

A and E (9.0)

1910.678	183°.07	43″.47
.720	183.50	43.11
.739	183.38	43.30
1910.71	183.32	43.29

The several components of Σ 848 are some of the principal stars of *h* 379.

No material change since Struve.

3176. OΣ 134. (7.0...8.3)

R. A. $6^h\ 1^m\ 54^s$ Decl. + 24° 27′

1910.835	188°.9	31″.18
.838	187.5	30.85
.856	188.2	30.90
1910.84	188.2	30.98

In *h* 377; mostly small stars. No relative motion.
For the principal star we have:

A. G. Ber. 0″.087 in 69°.9

3179. Σ 852. (8.7...9.7)

R. A. $6^h\ 2^m\ 7^s$ Decl. + 7° 23′

A and C (9.3)

1908.862	28°.50	43″.71
.884	29.00	44.01
.898	29.27	43.93
1908.88	28.92	43.88

No other measures since Dembowski.

3186. 4 *Monocerotis*. β 17. (6.5...10.5)

R. A. $6^h\ 2^m\ 48^s$ Decl. — 11° 8′

A and B

1906.906	181°.3	3″.02
7.102	184.8	3.24
7.791	182.8	3.03
1907.27	183.0	3.10

A and C (11.5)

1906.906	248°.3	9″.09
7.102	247.9	9.11
7.791	247.4	8.90
1907.27	247.9	9.03

The components appear to have a common proper motion.

Auwers 0″.029 in 84°.2

3197. β 1242. (8.6...8.8)

R. A. $6^h\ 3^m\ 42^s$ Decl. — 6° 18′

AB and C (= H 2298). (10.7)

1909.760	93°.15	43″.80
10.091	93.48	43.94
10.093	93.12	43.71
1909.98	93.25	43.82

The principal star of H 2298 is in *h* 381. The Herschel nebula IV. 19 is 2^m *p* and 4′ *s* and surrounds the 9.5 m star SD (6°) 1415.

h 381 (star) and SD (6°) 1414

1910.091	192°.55	88″.23
.093	192.63	87.81
1910.09	192.59	88.02

3219. H 2301. (11.0...11.3)

R. A. $6^h\ 5^m\ 43^s$ Decl. + 5° 28′

1911.164	353°.9	10″.00
.796	354.7	10.14
1911.48	354.3	10.07

The components of H 2301 are among the smaller stars of *h* 384. The angle in the Hd measure of 1867 is erroneous.

3229. OΣ (App.) 70. (7.0...7.5)

R. A. $6^h 6^m 49^s$ Decl. + 24° 1′

1910.971	178°.00	115″.42
11.107	178.00	115.69
11.142	177.97	115.71
1911.07	177.99	115.61

Perhaps diminution in distance.

3238. Σ 872. (6.0...7.0)

R. A. $6^h 7^m 34^s$ Decl. + 36° 11′

A and B

1908.766	217°.5	11″.19
.788	217.0	11.41
.804	216.8	11.21
1908.79	217.1	11.27

A and C (11.0)

1908.766	284°.20	203″.35
.788	284.10	203.59
.826	284.02	203.93
1908.79	284.11	203.62

The only other measure of the distant small star is:

1879.53	286°.88	201″.03	2n	Bl.

A comparison of this with the recent measures implies a proper motion of A much larger than that given by meridian positions:

Measures	0″.346	in	30°.3
Auwers	0.076	in	270.0
Boss	0.062	in	270.0

The proper motion of B is given:

Boss 0″.035 in 240°.7

It is possible that we have here an excessively rare example of a small star with a sensible proper motion, of which only a few instances are known in the entire heavens. It is not probable that there is any very large error in the old value, considering the magnitude of the principal star; and still less probable that the faint comparison star is moving at all. Therefore, the explanation must be first looked for in errors of the micrometer positions.

It may be suggested that the first measures belong not to AC, but to BC. In that case my measures reduced to BC would stand, 287°.11 : 199″.32, which would still leave too large a change.

To show hereafter whether there is really any motion in C, I have connected a third star:

C and D (11.1)

1908.788	164°.10	120″.53
.826	163.80	120.21
.843	164.15	120.17
1908.82	164.02	120.30

3239. η *Geminorum.* β 1008. (4.2...8.8)

R. A. $6^h 7^m 38^s$ Decl. + 22° 32′

1906.966	290°.6	1″.24

3241. 71 *Orionis.* H 2302. (5.3...11.0)

R. A. $6^h 7^m 46^s$ Decl. + 19° 12′

A and B

1907.865	202°.53	28″.15
7.997	202.30	28.15
8.000	202.65	28.11
1907.95	202.49	28.14

A and C (11.3)

1907.865	267°.47	78″.05
7.997	267.25	77.43
8.000	267.05	77.39
1907.95	267.26	77.62

A and D (10.8)

1907.865	253°.83	87″.73
7.997	253.62	87.49
8.000	253.92	87.61
1907.95	253.79	87.61

The prior measures of AB are given in the *General Catalogue.* For the distant stars we have the following:

AC	1886.23	264°.92	80″.74	2n	Eng
AD	1886.23	251.89	91.17	2n	Eng

A comparison of the Eng and β positions of the three companion stars gives for the proper motion of 71 *Orionis:*

AB	R. A. — 0″.065	Decl. — 0″.166
AC	0.133	0.159
AD	0.116	0.179
	— 0.105	— 0.168

Hence the proper motion of the large star is:

0″.198 in 212°.0

Other values from meridian positions are:

Auwers	0″.203	in	213°.4
Stumpe	0.283	in	203.2
Porter	0.222	in	212.5
Hedrick	0.213	in	204.3
Boss	0.223	in	205.9

3250. Σ 876. (8.5...11.0)

R. A. $6^h 8^m 44^s$ Decl. + 53° 42′

A and C (7.5)

1909.744	281°.70	209″.39
10.049	281.65	209.48
10.128	281.83	209.19
1909.97	281.73	209.35

C is Groombridge 1122, which is given a proper motion of 0″.016 in 350°.6.

1875	281°.2	210″.4		A. G. Harv.
1880.48	280.09	209.73	2n	Bl.

3267. Σ 878. (7.2...11.0)

R. A. $6^h\ 10^m\ 13^s$ Decl. + 62° 27′

A and B

1908.747	330°.10	23″.77
.788	330.75	23.89
.804	331.63	23.87
1908.78	330.83	23.84

From the measures of AB the proper motion of A is:

0″.129 in 182°.6

A and C (11.2)

1908.747	68°.10	114″.80
.788	67.95	114.72
.804	67.85	114.98
1908.78	67.97	114.83

The other measures of AC are too discordant to be used for the proper motion of A:

1880.22	69°.23	113″.57	1n	Bl
1880.74	68.32	112.07	1n	Bl.

3270. Σ 885. (8.5...10.2)

R. A. $6^h\ 10^m\ 26^s$ Decl. + 6° 2′

1910.739	297°.2	10″.27
.835	298.9	10.05
.856	297.2	9.69
1910.81	297.8	10.00

In *h* 385, a coarse scattering cluster.

3277. 4 *Lyncis*. Σ 881. (6.4...7.9)

R. A. $6^h\ 11^m\ 24^s$ Decl. + 59° 25′

AB and C (11.0)

1908.747	356°.00	100″.00
.788	356.05	100.22
.804	356.38	100.14
.843	356.25	100.14
1908.80	356.17	100.12

The previous measures are:

1879.25	355°.88	101″.14	1n	Bl
1879.71	355.68	100.38	1n	Bl

The measures of this star should be continued. The proper motion of 4 *Lyncis* is uncertain:

Auwers	0″.025	in	293°.6
Boss	0.006	in	20.9

There is a faint star near the close pair, not previously observed:

AB and *a* (12.9)

1908.788	96°.3	26″.37
.824	96.3	26.45
.826	95.9	25.47
.843	97.2	26.26
1908.82	96.4	26.14

3284. H 2307. (9.2...10.6)

R. A. $6^h\ 11^m\ 48^s$ Decl. + 54° 6′

1907.788	91°.5	23″.25
.791	91.4	23.34
.807	91.9	23.02
1907.80	91.6	23.20

Distance disagrees with prior measure.

3287. H 3845

R. A. $6^h\ 12^m\ 0^s$ Decl. — 22° 40′

1907.022	19°.2	35″.52

Comparing this with the measures by Doolittle in 1898 shows that the large star has a considerable proper motion. Further and later measures are necessary to give it a definite value.

Porter 0″.324 in 143°.3

3289. Σ 882. (8.0...11.0)

R. A. $6^h\ 12^m\ 6^s$ Decl. + 64° 58′

A and C (10.5)

1910.684	23°.73	119″.56
.701	24.07	119.25
.703	24.08	119.36
1910.70	23.96	119.39

Probably error in the angle of the only other position; the apparent change is impossible.

1880.48	13°.23	119″.35	2n	Bl.

3303. OΣ (App.) 74. (6.7...8.6)

R. A. $6^h\ 13^m\ 12^s$ Decl. + 25° 15′

A and B

1910.971	264°.35	57″.92
11.104	264.40	57.91
11.142	264.37	57.71
1911.07	264.37	57.85

No relative motion.

A and *a* (11.9)

1910.971	289°.33	41″.36
11.104	290.13	40.80
11.142	289.93	40.82
1911.07	289.80	40.99

No other measures of the faint star.

3313. S 513. (7.2...8.5)

R. A. $6^h\ 14^m\ 4^s$ Decl. + 21° 11′

B and C (12.0)

1910.971	84°.9	15″.06
11.104	86.5	14.90
11.142	86.1	14.98
1911.07	85.8	14.98

If there is any proper motion, it seems to be common to the three components.

The principal star is Piazzi VI. 62.

A. G. Berlin 0″.101 in 270°

3327. H 2315. (11.7...11.7)

R. A. 6ʰ 15ᵐ 6ˢ Decl. −7° 14′

1910.933	3°.1	6″.50
11.796	3.4	6.41
1911.36	3.2	6.45

The only other measures are my own in 1901.

H 2315 is in *h* 386, the principal star of which is SD (7°) 1384. Most of the stars are 10 to 13 m.

3339. Σ 896. (8.3...8.7)

R. A. 6ʰ 16ᵐ 21ˢ Decl. + 51° 56′

A and C (10.9)

1910.684	324°.30	40″.89
.701	323.70	40.71
.703	323.92	40.64
1910.70	323.97	40.75

The proper motion given A from meridian observations seems doubtful from the measures of this star.

1880.48	324°.42	40″.36	2n	Bl.

A. G. Harv. 0″.047 in 90°

3349. 8 *Monocerotis.* Σ 900. (4.0...6.7)

R. A. 6ʰ 17ᵐ 25ˢ Decl. + 4° 39′

A and B

1911.775	25°.9	13″.25
.796	27.3	13.21
.815	28.4	13.15
1911.79	27.2	13.20

A and C (12.2)

1911.777	254°.50	93″.42
.796	254.17	94.30
.832	254.67	93.43
1911.80	254.45	93.72

Large stars relatively fixed. No other measures of C. The proper motion of A is small and uncertain:

Auwers	0″.021	in	299°.1
Boss	0.012	in	255.9
Newcomb	0.011	in	325.7

3375. Σ 904. (9.0...10.2)

R. A. 6ʰ 20ᵐ 16ˢ Decl. + 51° 51′

A and C (8.5)

1910.684	92.60	237″.78
.701	92.75	237.75
1910.69	92.67	237.76

Apparently no proper motion in either.

1880.59	92°.30	237″.24	3n	Bl.

3379. Σ 905. (8.0...10.0)

R. A. 6ʰ 20ᵐ 31ˢ Decl. + 40° 12′

A and C (10.5)

1908.884	147°.53	151″.41
.898	147.73	151.52
.900	148.34	151.45
1908.89	147.87	151.46

From the earlier positions it is apparent that Σ 905 has no sensible proper motion. The second is from the *Astrographic Catalogue.*

1880.48	147°.52	151″.54	2n	Bl
1894.95	147.70	151.20		Donner

3381. Σ 906. (8.3...9.5)

R. A. 6ʰ 20ᵐ 34ˢ Decl. + 37° 27′

A and C (10.2)

1910.701	141°.20	155″.28
.720	141.17	155.58
.739	140.83	155.62
1910.72	141.07	155.49

In the early measure the distances are discordant, and differ as much as 1″.7, hence change is doubtful.

1880.60	140°.78	154″.57	3n	Bl.

3383. 15 *Geminorum.* Sh 70. (6.8...8.2)

R. A. 6ʰ 20ᵐ 37ˢ Decl. + 20° 52′

A and B

1911.720	204°.45	29″.00
.755	204.65	29.08
.775	204.78	29.00
1911.75	204.63	29.03

A and C (12.8)

1911.720	34°.28	77″.68
.775	33.90	77.73
1911.75	34.09	77.70

The faint star for the proper motion of A. No other measures:

Auwers	0″.058	in	237°.8
Hedrick	0.058	in	201.6
Boss	0.063	in	206.6

3402. 11 *Monocerotis.* β 570.

R. A. 6ʰ 23ᵐ 0ˢ Decl. −6° 57′

A and D (5.0...12.5)

1911.796	54°.6	25″.72
11.942	55.1	25.82
12.046	56.9	26.06
1911.93	55.5	25.87

The apparent change is very small, and later measures should be made. It is not likely that the faint star is moving with the others. The value of the proper motion is somewhat uncertain:

Auwers	0″.076	in	296°.4
Boss	0.037	in	270.0

3418. Σ 916. (8.5...9.8)

R. A. $6^h 24^m 2^s$ Decl. + 56° 44′

A and C (9.6)

1908.882	338°.18	55″.80
.884	337.21	56.32
.898	338.40	56.15
1908.89	337.93	56.09

Change doubtful.

1880.48	336°.30	56″.17	2n	Bl

3422. OΣ 143. (6.8...9.9)

R. A. $6^h 24^m 12^s$ Decl. + 17° 1′

A and C (11.5)

1911.775	342°.83	42″.56
.796	342.92	42.70
.835	342.93	42.38
1911.80	342.89	42.55

For the proper motion of the principal star. This has been given:

A. G. Ber.	0″.089	in	191°.1

3423. *Aurigae* 229. Σ 918. (6.7...7.7)

R. A. $6^h 24^m 21^s$ Decl. + 52° 33′

B and C (10.0)

1908.884	26°.87	135″.80
.898	26.85	135.62
.900	26.95	135.93
1908.89	26.89	135.78

Further measures are needed to correct the proper motion of A:

1880.48	27°.18	133″.75	2n	Bl

The proper motion of A is given:

A. G. Harv.	0″.033	in	270°.0

3449. Σ 928. (7.4...8.0)

R. A. $6^h 26^m 26^s$ Decl. + 38° 38′

B and C (11.0)

1910.701	122°.93	128″.94
.720	123.13	128.00
.739	122.60	128.23
1910.72	122.89	128.39

The principal star has no sensible proper motion:

Groombridge	0″.011	in	218°.0

The three stars are relatively fixed.

1880.52	122°.73	128″.84	2n	Bl

3450. Σ 922. (7.2...11.0)

R. A. $6^h 26^m 33^s$ Decl. + 64° 50′

A and B

1912.066	135°.6	10″.58

A and C (10.5)

1912.066	5°.4	25″.46

From the measures of AC by Σ, Δ, and β (1831-1912) we have for the proper motion of the principal star:

0″.022 in 323°.7

B appears to be moving at about the same rate and direction. They may make a system of the 61 *Cygni* type.

3490. Σ 941. (7.0...8.0)

R. A. $6^h 30^m 11^s$ Decl. + 41° 41′

A and C (10.4)

1909.703	133°.82	82″.76
.744	133.95	83.02
.821	133.63	83.19
1909.76	133.80	82.99

From the *Astrographic Catalogue* we have:

1894.95	134°.3	82″.56	Donner

This is doubtless the star observed as Sh 367, and given with a large error in the distance.

3500. Ho 515. (8.0...12.2)

R. A. $6^h 30^m 58^s$ Decl. + 9° 14′

A and B

1909.706	251°.1	10″.05
.838	252.0	10.67
.936	250.6	10.29
1909.83	251.2	10.34

A and C (13.6)

1909.838	103°.5	13″.06

C has not been previously seen; a third faint star more distant. The principal star was wrongly identified by Hough. It should be DM (9°) 1306 instead of 1281. The place is substantially correct.

About 30′ distant, *sf* Ho 515 is the curious object, *h* 399, which has a well-defined nucleus, with a comet-like tail, spread out like a fan in the direction of 70°.

h 399 and DM (8°) 1418

1909.838	37°.9	140″.87
.936	38.3	141.24
1909.89	38.1	141.06

3502. Arg 15. (8.4...9.0)

R. A. 6^h 31^m 7^s Decl. — 24° 2′

1907.022	233°.8	37″.86

No other measures of this pair.

3512. Σ 944. (8.0...10.0)

R. A. 6^h 31^m 44^s Decl. + 48° 22′

A and C (9.3)

1910.091	181°.42	194″.24
.093	181.45	194.79
.109	181.58	194.82
1910.10	181.48	194.62

No change in AB. C is DM (48°) 1412.

1875	181°.1	195″.6		A. G. Bonn
1881.54	181.03	196.55	2n	Bl.

3521. HΣ. (7.8...7.8)

R. A. 6^h 32^m 35^s Decl. + 9° 45′

1907.675	281°.9	0″.77
7.694	275.2	0.70
8.709	276.4	0.78
1908.02	277.8	0.75

Probably unchanged.

3534. Σ 951. (8.5...10.7)

R. A. 6^h 33^m 51^s Decl. + 9° 56′

A and B

1908.884	309°.4	21″.43
9.071	310.1	21.33
9.091	309.7	21.39
1909.02	309.7	21.38

B and C (12.0)

1908.884	229°.4	11″.30
9.071	230.2	11.31
9.091	228.4	11.77
1909.02	229.3	11.46

There is a misprint in the angle of BC in Part II of the *General Catalogue; for* 209°.9 *read* 229°.9.

3553. H 2335. (9.0...11.5)

R. A. 6^h 34^m 56^s Decl. + 1° 18′

1911.947	102°.8	17″.57
12.046	101.7	17.44
1911.99	102.2	17.50

No other measures. *h* 400 is 1^m 40^s *p* H 2335; mostly small stars.

3559. 12 *Lyncis.* Σ 948

R. A. 6^h 35^m 38^s Decl. + 59° 34′

A and D (5.2...10.8)

1910.049	257°.45	173″.53
.091	257.52	172.43
.093	257.35	172.79
1910.08	257.44	172.92

A prior measure is:

1879.48	254°.92	167″.01	2n	Bl.

Further measures are needed. The apparent change seems too large for the proper motion of A.

The proper motion of 12 *Lyncis* is doubtful:

Auwers	0″.085	in	275°.4
Boss	0.015	in	273.8
Groombridge	0.035	in	256.8

3580. Σ 957. (7.5...9.0)

R. A. 6^h 37^m 27^s Decl. + 30° 57′

1907.791	92°.7	3″.25
.810	91.3	3.40
.848	92.1	3.43
1907.82	92.0	3.36

No measures since 1866. Without change. Two faint stars following; the nearest 13.5 m from A, 101°.1 : 18″.9.

3587. Σ 958. (6.0...6.0)

R. A. 6^h 38^m 11^s Decl. + 55° 50′

B and C (10.9)

1910.049	264°.57	165″.00
.091	264.48	164.97
.109	264.72	165.53
1910.08	264.59	165.17

The only other measure is:

1880.47	263°.34	163″.35	2n	Bl.

From these measures we have for the proper motion of A:

0″.137 in 147°.3

From meridian positions:

Bossert	0″.112	in	153°.2
Boss	0.126	in	148.7

3589. A. G. 120.

R. A. 6^h 38^m 31^s Decl. + 3° 48′

Not double, and nothing near answering the description (1906.79).

3596. Sirius. A. G. Clark 1.

R. A. $6^h\ 39^m\ 53^s$ Decl. — 16° 33′

1908.750	94°.67	8″.56
.769	94.06	8.60
.939	93.60	8.80
.974	94.35	8.83
1908.86	94.17	8.70

3600. Σ 960. (7.3...9.2)

R. A. $6^h\ 40^m\ 1^s$ Decl. + 53° 10′

1908.747	66°.7	21″.79
.788	66.8	21.90
.824	68.2	21.80
1908.79	67.2	21.83

No other measures since 1867. The principal star is given a small proper motion:

A. G. Harv. 0″.041 in 227°.5

3604. Σ 965. (8.3...10.3)

R. A. $6^h\ 40^m\ 36^s$ Decl. + 11° 3′

A and C (13.0)

1912.810	318°.3	16″.30
.867	318.2	16.50
.890	320.3	16.58
1912.85	319.0	16.46

A and D (8.7)

1912.810	63°.97	44″.59
.867	64.67	44.35
.890	64.93	44.16
1912.85	64.52	44.37

The measures of the two more distant companions are now sufficient for a very accurate determination of the proper motion of the two principal components. From the measures of AC (1879-1912) and of AD (1829-1912) we have for the motion of A:

Measures of AC	R. A. + 0″.055	Decl. — 0″.038
Measures of AD	+ 0.053	— 0.045

Therefore the annual movement of A and the near companion, B, is:

0″.068 in 127°.9

3606. Σ 962. (8.5...8.5)

R. A. $6^h\ 40^m\ 42^s$ Decl. + 26° 50′

1907.807	242°.1	26″.00
8.671	242.4	25.80
8.692	242.2	26.10
1908.39	242.2	25.97

No late measures; unchanged.

3612. Espin 15. (6.8...10.2)

R. A. $6^h\ 41^m\ 10^s$ Decl. + 46° 19′

1908.997	275°.6	29″.09
9.091	275.8	29.09
9.093	275.8	29.30
1909.06	275.7	29.16

No proper motion found for the bright star. The distance in the former measures appears to be too small.

3625. 14 *Lyncis.* Σ 963. (5.9...7.1)

R. A. $6^h\ 42^m\ 30^s$ Decl. + 59° 35′

AB and C (11.1)

1910.049	121°.50	180″.75
.091	121.55	180.66
.093	121.25	180.98
1910.08	121.43	180.80

The other measures are:

1879.24	121°.53	181″.65	1n	Bl
1879.71	121.87	180.75	1n	Bl.

Little or no relative change. The proper motion of 14 *Lyncis* is small and uncertain.

Groombridge	0″.037	in	199°.1
Boss	0.047	in	270.0
Auwers	0.047	in	220.9

3626. A 58. (7.6...8.3)

R. A. $6^h\ 42^m\ 39^s$ Decl. — 3° 58′

1906.796	148°.1	4″.22
.966	147.9	4.35
1906.88	148.0	4.28

The only other measure is given in Part I of the *General Catalogue.*

3627. Espin 67. (8.7...10.0)

R. A. $6^h\ 42^m\ 49^s$ Decl. + 40° 38′

1907.807	307°.8	5″.78
8.063	309.3	5.91
8.671	310.0	5.91
1908.18	309.0	5.87

3633. Σ 968. (8.0...9.0)

R. A. $6^h\ 43^m\ 17^s$ Decl. + 52° 50′

A and B

1907.120	287°.1	20″.59
.137	288.2	20.54
.140	287.7	20.97
1907.13	287.7	20.70

These stars have no relative motion. The principal star is given some proper motion:

A. G. Harv. 0″.144 in 206°.0

There is a 13.5 m star not previously seen:

B and C

1907.120	59°.8	8″.38
7.137	59.6	8.19
7.791	60.2	8.29
8.633	61.9	8.46
8.769	61.0	8.67
1907.89	60.5	8.39

3653. 59 *Aurigae.* Σ 974. (6.7...10.0)

R. A. $6^{h}\,44^{m}\,46^{s}$ Decl. + 39° 1′

A and B

1908.636	223°.9	22″.34
.652	224.0	22.43
.671	223.3	22.40
1908.65	223.7	22.39

B and C (13.3)

1908.689	217°.5	25″.78
.824	219.3	25.74
.843	219.8	26.01
1908.79	218.9	25.84

No late measures of AB, and no other measures of the faint star.

The proper motion of 59 *Aurigae* is very uncertain:

Auwers	0″.035	in	86°.7
Boss	0.008	in	49.4

3670. Σ 977. (8.0...9.5)

R. A. $6^{h}\,46^{m}\,20^{s}$ Decl. + 48° 43′

A and B

1910.720	127°.4	1″.97
.739	129.0	2.00
1910.73	128.2	1.98

A and C (10.7)

1910.720	223°.00	152″.29
.739	222.47	152.64
.770	222.82	153.07
1910.74	222.76	152.67

No proper motion in A:

1881.50	222°.47	152″.08	2n	Bl.

3678. 15 *Lyncis.* OΣ 159. (5.1...6.2)

R. A. $6^{h}\,46^{m}\,54^{s}$ Decl. + 58° 35′

A and D (9.5)

1907.848	167°.30	199″.33
8.000	167.30	199.14
8.025	167.58	199.11
1907.96	167.39	199.19

This, with the two positions by OΣ (1850-1907), gives for the proper motion of 15 *Lyncis:*

0″.130 in 163°.4

Other values from meridian observations are:

Auwers	0″.124	in	179°.6
Groombridge	0.126	in	190.7
Newcomb	0.131	in	172.3
Boss	0.134	in	177.7

3685. Σ 978. (7.0...10.0)

R. A. $6^{h}\,47^{m}\,22^{s}$ Decl. + 38° 3′

1908.728	90°.45	16″.42
.747	90.55	16.84
.766	89.43	16.82
1908.75	90.14	16.70

The measures of Σ, Δ and β (1831-1908) give for the true proper motion of the principal star:

0″.039 in 222°.5

The proper motion of A (Groombridge 1241) is given from meridian positions:

Greenwich 0″.048 in 250°.4

3692. 38 *Geminorum.* Σ 982. (5.4...7.7)

R. A. $6^{h}\,47^{m}\,52^{s}$ Decl. + 13° 20′

A and C (11.0)

1912.810	328°.17	109″.38
.867	328.00	109.23
.890	328.37	109.28
1912.85	328.18	109.30

Faint star for the proper motion of A; no other measures. From the star catalogues we have:

Auwers	0″.087	in	144°.3
Bossert	0.124	in	135.8
Boss	0.112	in	139.3

3710. Σ 991. (8.0...9.0)

R. A. $6^{h}\,49^{m}\,40^{s}$ Decl. + 25° 7′

A and B

1907.022	167°.2	3″.76
.102	168.7	3.73
.118	166.8	3.63
1907.08	167.6	3.71

Possibly slow retrograde motion in angle.

C and D (10.9...11.4)

1907.022	359°.5	13″.30
.118	358.5	13.09
1907.07	359.0	13.19

The principal star is correctly identified in Lewis' "Struve" as W^2 VI. 1453-4, and the correction on p. XXIII of the Introduction, changing it to 1449, is erroneous. The latter is not a double star. The pair measured by Lewis:

1904.22 358°.5 6″.30

I could not find unless it is the faint stars CD given above.

A and C

1907.022 202°.2 134″.4 Single dist.

3725. μ *Canis Min.* Σ 997. (4.7...8.0)

R. A. $6^h\ 50^m\ 36^s$ Decl. — 13° 53′

A and C (10.0)

1912.810	288°.10	87″.03
.867	288.30	86.76
.884	288.07	86.85
1912.85	288.16	86.88

A and D (10.2)

1912.810	61°.30	105″.94
.867	61.87	105.48
.884	61.93	105.57
1912.85	61.70	105.66

The other measures by Engelmann (1673) on a single night are:

AC	1865.18	288°.4	90″.0
AD	1865.18	60.7	107.0

These appear to be rough micrometer settings, and the measures should be continued for the proper motion of the large star. This is uncertain from the meridian positions:

Auwers	0″.027	in	282°.9
Boss	0.007	in	97.8

3752. 41 *Geminorum.* OΣ 162 *rej.* (6.2...11.7)

R. A. $6^h\ 52^m\ 57^s$ Decl. + 16° 6′

1912.810	155°.1	21″.34
.890	153.7	21.62
1912.85	154.4	21.48

It is obvious from a comparison of this with the prior measures by β, Doo and Hu that the principal star has no sensible proper motion; and this appears also from the transit positions.

Auwers	0″.033	in	293°.3
Boss	0.017	in	227.2

3793. Σ 1009. (6.7...6.8)

R. A. $6^h\ 56^m\ 7^s$ Decl. + 52° 56′

B and C (10.8)

1910.703	133°.15	178″.72
.720	133.57	178.32
.739	133.28	178.65
1910.72	133.33	178.56

The proper motion of A is uncertain:

Groombridge	0″.055	in	222°.0
A. G. Harv.	0.046	in	188.9

The only other measure of C is:

1879.51 133°.51 179″.62 2n Bl.

3797. ζ *Geminorum.* Sh 77. (4.0...10.5)

R. A. $6^h\ 56^m\ 59^s$ Decl. + 20° 45′

A and B (10.8)

1907.769	83°.82	86″.99
.772	83.87	87.25
.807	83.81	87.24
1907.78	83.83	87.16

A and C (8.5)

1907.769	350°.50	95″.05
.772	350.23	94.88
.807	350.45	95.28
1907.78	350.39	95.07

C and *c* (12.3)

1907.769	165°.73	27″.25
.772	166.40	27.13
.807	166.51	27.11
1907.78	166.21	27.16

The apparent motion of C from Δ in 1875 and the position of 1907 is:

0″.078 in 297°.6

Therefore the real proper motion of C, assuming the motion of A by Auwers to be correct, is:

0″.095 in 297°.0

It is evident from the only other measure of AB that neither of these stars has any sensible motion:

1880.01 83°.6 87″.22 2n β

Remeasurement of C*c* will give hereafter an independent value of the motion of the larger star.

It should be noted that the proper motion of ζ *Geminorum* from meridian observations is very uncertain:

Auwers	0″.017	in	294°.4
Newcomb	0.007	in	198.6
Boss	0.009	in	207.8

3817. H 749. (10.6...12.7)

R. A. $6^h\ 58^m\ 30^s$ Decl. — 11° 8′

A and B

1909.071 119°.0 14″.02

A and C (10.8)

1908.974	92°.6	83″.71
9.071	92.2	84.66
1909.02	92.4	84.18

A and D (11.0)

1908.974	85°.3	136".94
9.071	85.0	137.36
1909.02	85.1	137.15

A and E (11.0)

1908.974	71°.9	156".24
9.071	71.7	156.85
1909.02	71.8	156.54

H 749 is in the central part of *h* 428. In his observations of the latter, Engelhardt has compared A with the three brighter stars by differences of R. A. and Decl. from which we have:

AC	1887.06	91°.8	83".3	1n
AD	1887.06	85.1	135.7	1n
AE	1887.06	71.8	155.6	1n

The differences in distance do not suggest any real change, as they would be accounted for by the method of transists.

3852. Σ 1024. (8.3...8.8)

R. A. $7^h 2^m 3^s$ Decl. + 38° 19′

A and B

1908.974	315°.5	1".22
9.091	313.0	1.24
1909.03	314.2	1.23

No change in AB.

A and C (11.2)

1908.900	116°.23	107".29
8.974	116.23	106.80
9.091	115.83	107.23
1908.99	116.10	107.11

The other measures do not indicate any proper motion in AB.

1880.55 115°.44 107".03 2n Bl.

3857. H 3930. (9.7...10.6)

R. A. $7^h 2^m 48^s$ Decl. — 12° 59′

1910.835	73°.1	15".06
.933	73.0	15.14
1910.88	73.0	15.10

H 3930 is the largest star in *h* 3073. No other measures.

3858. Σ 1025. (7.5...7.8)

R. A. $7^h 2^m 56^s$ Decl. + 56° 0′

A and B

1908.898	135°.1	24".26
.900	134.5	24.10
.974	135.0	24.16
1908.92	134.9	24.17

The three positions by Σ, Δ and β (1830-1908) give for the apparent proper motion of A:

0".038 in 258°.2

A and C (11.0)

1908.898	253°.07	236".04
.900	252.93	236.01
.974	253.00	235.10
1908.92	253.00	235.72

The change in this is explained by the proper motion of A.

1880.54 252°.80 237".85 2n Bl.

As these two positions give an apparent movement in A of about 0".078, it is very probable that the 7.8 m star has a considerable motion of its own. This will appear from later measures of the two faint attendants.

C and *c* (11.6)

1908.900	250°.4	3".08
.994	249.6	3.12
1908.95	250.0	3.10

C and *d* (12.9)

1908.900	200°.9	22".54
.994	202.4	22.80
1908.95	201.6	22.67

3873. Σ 1032. (7.0...10.3)

R. A. $7^h 4^m 50^s$ Decl. + 48° 42′

A and C (9.0)

1908.826	319°.15	132".55
.843	319.24	132.11
.845	319.47	132.79
.862	318.98	132.06
1908.84	319.21	132.38

For comparison we have:

1879.1	318°.6	133".1		A. G. Bonn
1880.52	318.83	132.98	2n	Bl.

C is DM (48°) 1488

3905. 52 *Geminorum.* Ho 343. (6.2...11.6)

R. A. $7^h 7^m 22^s$ Decl. + 25° 6′

1910.760	262°.7	23".88
.780	266.8	23.83
.856	264.5	23.89
1910.80	264.7	23.87

From a 20-year interval in the micrometer measures the proper motion of the large star from meridian positions appears to be too small. The four positions by Ho, Doo and β give:

Measures	0".174	in	145°.3
Boss	0.105	in	151.4
A. G. Ber.	0.111	in	160.7

3906. Σ 1042. (8.3...10.3)

R. A. $7^h 7^m 25^s$ Decl. + 42° 21′

A and B

1907.788	40°.8	11″.84
7.791	40.5	11.87
8.063	41.6	12.20
8.689	41.2	12.00
1908.08	41.0	11.98

A and C (13.5)

1907.791	78°.5	24″.21
8.785	80.0	24.49
8.788	77.7	24.37
1908.45	78.7	24.36

No measures of AB since 1867. The faint star has not been previously observed. The principal star is DM (42°) 1686. The brighter star DM (42°) 1685 is in the field.

3908. Σ 1039. (8.8...9.5)

R. A. $7^h 7^m 27^s$ Decl. + 63° 44′

A and B

1908.769	207°.3	3″.14
.785	210.3	3.01
.788	208.6	3.09
1908.78	208.7	3.08

A and C (8.5)

1908.769	310°.83	127″.58
.785	311.27	127.54
.788	310.80	127.67
1908.78	310.97	127.60

No measures of AB since 1869. C is DM (64°) 699.

1880.56	311°.35	127″.22	2n	Bl.

3909. Σ 1047 (7.3...9.8)

R. A. $7^h 7^m 28^s$ Decl. + 15° 58′

B and C (11.4)

1908.769	297°.41	35″.91
.788	297.80	35.83
.843	298.25	35.73
1908.80	297.82	35.82

The principal star appears to have a small proper motion. The measures of the third star will show whether or not B has any movement.

3915. Σ 1048. (8.3...10.2)

R. A. $7^h 7^m 54^s$ Decl. + 4° 25′

1906.796	349°.7	5″.66
.964	350.1	5.86
1906.88	349.9	5.76

No change.

3927. Σ 1052. (8.5...8.7)

R. A. $7^h 8^m 52^s$ Decl. — 10° 4′

1906.796	21°.4	19″.77
.964	21.6	19.95
1906.88	21.5	19.86

No change.

3943. Σ 1050. (7.3...8.0)

R. A. $7^h 10^m 6^s$ Decl. + 55° 8′

A and B

1908.788	20°.15	19″.33
.804	20.13	19.33
.843	19.30	19.36
1908.81	19.86	19.34

No change since 1829.

A and C (11.5)

1908.785	226°.13	197″.30
.788	225.77	197.40
.843	225.97	197.48
1908.81	225.96	197.39

The prior measure is on a single night only, and change is doubtful. It should be remeasured later.

1880.28	225°.48	199″.38	1n	Bl.

3944. Σ 1054. (7.3...8.5)

R. A. $7^h 10^m 10^s$ Decl. + 35° 10′

A and B

1908.766	291°.9	18″.72
.785	291.4	18.53
.788	292.1	18.64
1908.78	291.8	18.63

B and C (9.2)

1908.766	267°.90	79″.40
.785	268.03	79.26
.788	267.95	79.80
1908.78	267.96	79.49

No change in AB, and probably none in the other.

1880.54	267°.15	79″.83	2n	Bl.

3948. 47 *Camelop.* Σ 1055. (6.0...10.5)

R. A. $7^h 9^m 46^s$ Decl. + 60° 7′

1907.120	329°.1	2″.12
.137	329.8	2.03
8.728	329.6	2.03
.769	334.9	2.17
.898	329.4	2.02
1908.13	330.5	2.07

The R. A. of this in the *General Catalogue* is 1^m too large. The proper motion of the large star is doubtful:

Auwers	0″.068	in	276°.8
Boss	0.011	in	49.6

3962. Σ 1051. (6.5...8.6)

R. A. $7^h\ 12^m\ 7^s$ Decl. + 73° 19′

A and C (6.7)

1912.755	82°.1	31″.34
.791	82.8	31.85
.793	82.7	31.39
1912.78	82.5	31.53

C and D (13.0)

1912.755	124°.93	46″.36
.791	125.62	46.09
.793	125.93	46.56
1912.78	125.49	46.34

No other measures of D. The large stars have a common proper motion:

Bossert	0″.059	in	250°.3
Greenwich	0.053	in	247.8

3965. Σ 1069. (8.3...8.3)

R. A. $7^h\ 12^m\ 32^s$ Decl. — 13° 29′

1907.022	193°.6	25″.23
7.137	194.7	25.08
9.170	194.1	25.36
1907.78	194.1	25.22

No change.

3971. S 546. (8.5...8.6)

R. A. $7^h\ 13^m\ 4^s$ Decl. + 31° 42′

A and B

1911.755	358°.10	83″.37
.835	357.83	83.46
.870	358.50	83.22
1911.82	358.14	83.35

A and C (8.6)

1911.755	67°.57	144″.05
.835	67.63	143.52
.870	68.30	143.93
1911.82	67.83	143.83

If the measures of 1825 are substantially correct, there has been considerable change from proper motion; later observations will determine this.

3973. 19 *Lyncis.* Σ 1062. (5.3...6.6)

R. A. $7^h\ 13^m\ 4^s$ Decl. + 55° 30′

B and C (11.0)

1908.766	287°.03	74″.20
.769	287.46	74.52
.788	287.60	74.31
1908.77	287.36	74.34

The only other measures of this are uncertain in distance and angle:

1879.33	288°.45	73″.70	1n	Bl
1879.78	286.07	74.72	1n	Bl.

A and B have a common proper motion, if there is any motion.

Auwers	0″.048	in	226°.4
A. G. Hels	0.062	in	216.8
Boss	0.038	in	177.4

3977. Σ 1070. (8.2...9.2)

R. A. $7^h\ 13^m\ 31^s$ Decl. + 34° 15′

A and B

1908.769	322°.9	1″.74
9.071	322.8	1.83
1908.92	322.8	1.78

A and C (10.7)

1908.766	122°.00	87″.16
.769	121.66	87.16
.788	122.43	87.44
1908.77	122.03	87.25

There is no sensible proper motion in AB:

1880.55	122°.38	87″.91	2n	Bl.

3991. Σ 1071. (8.2...10.2)

R. A. $7^h\ 14^m\ 22^s$ Decl. + 45° 14′

1911.835	13°.9	17″.01
12.046	14.5	16.93
12.066	15.5	16.98
1911.98	14.6	16.97

From the measures by Σ, Δ, Doo and β (1829-1911) we have for the proper motion of A:

0″.054 in 255°.8

3994½. 56 *Geminorum.* (6.0...13.0)

R. A. $7^h\ 14^m\ 52^s$ Decl. + 20° 40′

1912.810	203°.6	16″.91
.867	203.3	17.39
1912.84	203.4	17.15

The only other measures are of recent date:

1901.08	205°.1	17″.75	2n	β

The observations should be continued for the proper motion of the bright star.

Measures	0″.067	in	248°.1
Auwers	0.075	in	263.9
Boss	0.069	in	241.3

4001. OΣ (App.) 84. (7.0...7.3)

R. A. $7^h\,15^m\,21^s$ Decl. + 56° 48′

A and B

1911.755	324°.97	114″.15
.835	325.07	113.57
.870	325.30	113.95
1911.82	325.11	113.89

B and C (12.3)

1911.755	193°.63	37″.43
.835	194.33	37.45
.870	194.83	37.64
1911.82	194.26	37.51

One of these large stars appears to have a small proper motion. I have, therefore, connected a faint star.

4012. Σ 1075. (8.0...10.0)

R. A. $7^h\,16^m\,37^s$ Decl. + 63° 14′

A and DM (63°) 708 (9.3)

1910.701	333°.33	223″.27
.835	333.38	223.28
.895	333.22	223.59
1910.81	333.31	223.38

Evidently the principal star has no sensible proper motion:

1880.57	333°.21	223″.51	2n	Bl.

4045. Σ 1087 and 1088. (7.0...9.0)

R. A. $7^h\,19^m\,15^s$ Decl. + 14° 20′

A and B

1909.744	195°.9	11″.26
.821	194.8	11.21
.838	195.1	10.97
1909.80	195.3	11.15

A¹ and B¹ (8.2...11.5)

1909.744	40°.6	21″.28
.821	40.2	21.08
.838	41.1	21.17
1909.80	40.6	21.18

A and A¹

1909.744	238°.20	112″.36
.821	238.30	112.62
.838	238.27	112.58
1909.80	238.26	112.52

No sensible relative motion.

4049. Σ 1090. (7.0...8.0)

R. A. $7^h\,19^m\,28^s$ Decl. + 18° 45′

A and B

1906.796	97°.8	60″.57
7.022	98.0	60.49
7.102	97.5	60.73
1906.97	97.8	60.60

B and C (9.5)

1906.796	322°.6	20″.22
7.022	322.0	20.23
7.102	323.3	20.37
1906.97	322.6	20.27

No other measures since 1867.

4051. H 3964.

R. A. $7^h\,19^m\,51^s$ Decl. — 20° 47′

1911.796	347°.7	4″.52

No evidence of material change. As described by Herschel, the components of H 3964 are among the brightest stars of *h* 3083. The latter is given of the 8th class.

4059. 63 *Geminorum*. Sh 368.

R. A. $7^h\,20^m\,37^s$ Decl. + 21° 42′

1908.843	323°.09	42″.93
.862	323.05	42.65
.884	323.12	43.33
.898	323.23	42.95
1908.87	323.12	42.96

It is probable that the companion has the same proper motion as the large star.

Auwers	0″.122	in	214°.1
Boss	0.133	in	203.5

A and C (10.5)

1909.760	218°.75	145″.70
.818	218.63	145.69
.821	218.33	146.20
1909.80	218.57	145.86

No other measures of C.

4070. OΣ (App.) 85. (7.3...8.2)

R. A. $7^h\,21^m\,23^s$ Decl. + 24° 54′

A and B

1911.755	.....	58″.46
.775	24°.70	58.30
.835	24.73	58.49
1911.79	24.71	58.42

Comparing this position with that of Δ in 1875, we have the proper motion of A:

0″.082 in 161°.4

B is DM (24°) 1666, where the magnitude is given 9.2. There is little probability that the small star has any movement which would affect this result. This will appear from future measures of a much fainter star:

A and *a* (11.4)

1911.755	131°.95	34″.41
.775	131.47	34.22
.835	131.63	34.53
1911.79	131.68	34.39

4098. Σ 1104. (6.7...8.3)

R. A. $7^h 23^m 55^s$ Decl. — 14° 44′

A and C (11.5)

1910.148	187°.98	20″.30
.164	188.40	20.26
.933	187.10	20.58
1910.41	187.83	20.38

A and D (12.0)

1910.148	7°.82	40″.77
.164	7.30	41.23
.933	6.70	41.09
1910.41	7.27	41.03

The apparent motion of C with reference to A is only about 0″.03 annually, which may be explained by errors of observation. This seems to be a system of the 61 *Cygni* type, but with three components. The proper motion of the group from the measures of D (1882-1910) is:

Measures of AD	0″.334	in	217°.3
Porter	0.312	in	216.1
Paris	0.327	in	209.5

4103. Σ 1098. (9.0...9.0)

R. A. $7^h 24^m 27^s$ Decl. + 59° 49′

1907.120	284°.9	26″.93
.137	286.1	26.95
.140	286.4	27.31
1907.13	285.8	27.06

No other measures since 1868.

4111. Σ 1109. (8.8...8.8)

R. A. $7^h 25^m 47^s$ Decl. — 0° 16′

A and B

1907.102	19°.0	2″.90
.120	16.4	3.14
.137	18.7	3.08
1907.12	18.0	3.04

A and C (11.0)

1907.102	306°.8	26″.89
.120	307.1	27.03
.137	306.8	26.87
1907.12	306.9	26.93

No recent measures of either.

4118. Σ 1112 *rej.* (7.8...10.5)

R. A. $7^h 26^m 21^s$ Decl. — 8° 37′

1910.148	112°.5	23″.86
.164	112.6	23.64
.206	112.2	23.24
1910.17	112.4	23.58

The small star appears to be moving with the other.

Radcliffe	0″.167	in	206°.3
Porter	0.188	in	217.3

4121. H 2392. (10.5...11.4)

R. A. $7^h 26^m 56^s$ Decl. + 71° 56′

1910.701	167°.3	26″.01
.739	167.4	26.38
1910.72	167.3	26.19

H 2392 is in *h* 452; mostly small stars. No other measures.

4130. OΣ 175. (6.0...6.6)

R. A. $7^h 27^m 31^s$ Decl. + 31° 13′

AB and C (10.0)

1908.689	194°.70	81″.55
.709	194.85	81.53
.728	194.18	81.46
1908.71	194.58	81.51

The only other measures are those by Glasenapp given in the *General Catalogue*. For the proper motion of the close pair we have:

Auwers	0″.046	in	294°.3
Boss	0.032	in	268.2

4152. H 3295.

This is the same as Σ 1118 *rej.* (No. 4148). The nebula referred to by Herschel is *h* 457 which is in the field with, and closely following, the 7.3 m star, DM (39°) 1979. It is too diffused for accurate measurement.

4159. OΣ (App.) 87. (7.0...7.0)

R. A. $7^h 30^m 29^s$ Decl. + 42° 44′

1908.804	178°.38	64″.39
.826	178.63	64.50
.846	178.78	64.14
1908.83	178.60	64.34

Distance apparently decreasing. Dembowski found 65″.51 in 1875.

4162. Σ 1120. (6.5...9.5)

R. A. $7^h 30^m 32^s$ Decl. — 14° 13′

1910.933	36°.5	19″.77
11.008	38.5	19.74
11.107	36.4	19.47
1911.02	37.1	19.66

No material change. This and several other doubles form a portion of *h* 459 (= *h* 3088).

4164. 70 *Geminorum.* β 200. (5.9...11.0)

R. A. $7^h 30^m 40^s$ Decl. + 35° 19′

A and B

1911.870	190°.80	100″.57
12.008	190.55	99.81
12.011	190.15	100.43
12.046	190.55	99.97
1911.98	190.51	100.20

A and C (10.0)

1911.870	99°.30	160″.47
12.008	99.15	161.45
12.046	99.10	160.83
1911.97	99.18	160.92

From five positions of AB by Δ, Doo and β (1876-1911) we have for the corrected proper motion of the large star:

Measures	0″.058	in	44°.0
Auwers	0.029	in	35.5
Boss	0.043	in	65.3

It should be noted that Dembowski's measure of the other distant companion is of A and CD, and not A and C; and in my measure in 1880, the distance 160″.47 should read 161″.04.

About 2°′ *np* 70 *Geminorum* is *h* 456. It is round and small, but bisection not very exact. The measures connect it with a 9.0 m star in the field.

DM (35°) 1658 and *h* 456

1911.870	249°.4	106″.5
12.046	247.1	108.5
1911.96	248.2	107.5

4168. H 5470

R. A. $7^h\,31^m\,5^s$ Decl. — 14° 13′

Herschel said this was not identical with Σ 1120, and it could not be if his description was correct, but probably that was erroneous, and it now appears to be the same as Σ 1121, with error in the estimated angle. It is in the central part of *h* 459.

4169. Σ 1121. (7.2...7.5)

R. A. $7^h\,31^m\,5^s$ Decl. — 14° 13′

A and C (12.3)

1908.939	133°.45	17″.76
9.164	133.57	17.40
9.170	132.05	17.42
1909.09	133.02	17.53

A and D (9.9)

1908.884	98°.67	64″.59
8.939	98.58	64.47
9.164	98.74	64.25
1909.00	98.66	64.44

A and E (11.1)

1908.884	238°.57	72″.26
8.939	238.28	72.24
9.164	238.74	71.96
1909.00	238.53	72.15

A and F (11.3)

1908.939	315°.08	83″.19
9.170	315.45	83.80
9.186	315.55	83.64
1909.10	315.36	83.54

A and G (8.5)

1908.884	1°.28	84″.21
8.939	0.92	84.15
9.164	1.30	84.00
1909.00	1.17	84.12

A and H (10.0)

1909.164	268°.50	149″.91
.170	268.30	149.62
.186	268.55	149.78
1909.17	268.45	149.77

A and I (7.5)

1908.939	26°.10	164″.88
9.164	26.47	165.03
9.170	26.23	165.24
1909.09	26.27	165.05

A and J (8.8)

1909.186	354°.55	196″.90
.206	354.04	196.76
.227	354.25	196.29
1909.21	354.28	196.65

Σ 1121 is the principal star of *h* 459. Some of the other stars of the cluster were remeasured in the hope of finding a small star with some proper motion. So far, the differences from the results found by Glasenapp are no larger than the probable errors in the average set of measures. The observations by Glasenapp are:

AC	1893.19	132°.99	16″.17	1n
AD	1893.18	98.06	65.07	2n
AE	1893.18	238.88	72.34	2n
AF	1893.18	315.14	84.55	2n
AG	1893.18	0.80	84.63	2n
AH	1893.18	268.33	150.26	2n
AI	1893.18	26.00	165.23	2n
AJ	1893.19	354.06	196.31	2n

4183. H 765. (8.6...11.0)

R. A. $7^h\,32^m\,30^s$ Decl. + 27° 0′

A and B

1911.104	214°.2	22″.93
.142	213.5	23.48
.145	213.5	23.39
1911.13	213.7	23.27

A and C (11.0)

1911.104	298°.1	41″.16
.142	296.4	41.14
.145	296.8	40.82
1911.13	297.1	41.04

The proper motion of A from meridian observations seems to be much too large. From the measures of the two companions (1901-1911) the motion of that star is:

Measures	0″.064	in	164°.5
Porter	0.163	in	181.9

4186. 24 *Lyncis.* H 2405. (5.0...9.5)

R. A. $7^h 32^m 51^s$ Decl. + 58° 59′

1911.104	319°.93	54″.92
.107	320.23	54.83
.142	320.20	54.80
1911.12	320.12	54.85

The interval is too short for a high degree of accuracy in the proper motion. Later measures will give a better value:

Measures	0″.066	in	213°.7
Groombridge	0.058	in	212.8
Boss	0.068	in	206.3
Auwers	0.077	in	217.7

4210. Schj 7. (8.5...9.5)

R. A. $7^h 35^m 1^s$ Decl. + 9° 29′

1910.780	345°.41	30″.02
.735	345.88	30.45
.933	345.17	30.13
1910.82	345.49	30.20

No other measures. *h* 462 is closely following; has no central condensation for accurate setting of the wires.

Schj 7 and *h* 462

1910.83 Δ R. A. + $70^s.2$ Δ Decl. + 210″.5

h 462 and DM (9°) 1750 (9.5)

1910.83 143°.2 200″.5

The R. A. of *h* 462 is doubtful in Dreyer. From the comparison with Schj 7 we have for the place of *h* 462:

R. A. $7^h 35^m 5^s.2$ } 1860
Decl. + 9° 34′ 2″.5 }

4227. Σ 1134. (8.0...11.2)

R. A. $7^h 37^m 13^s$ Decl. + 3° 47′

A and B

1906.964	146°.3	10″.17
6.966	145.4	10.19
7.006	146.8	10.13
1906.98	146.2	10.16

Common proper motion.

The motion of A is given:

A. G. Alb. 0″.097 in 158°.2

A and C (10.6)

1906.964	346°.9	83″.48
6.966	346.8	83.76
7.006	346.7	83.42
1906.98	346.8	83.55

A and DM (3°) 1778

1906.694	Δ Decl. 52″.89
6.966	52.77
7.006	52.49
1906.98	52.72

The A. G. positions give 54″.4 (1881.0).

4247. Schj 8. (8.5...9.0)

R. A. $7^h 39^m 30^s$ Decl. + 14° 1′

1907.137	25°.7	2″.13
.197	28.6	2.09
1907.17	27.1	2.11

Unchanged since 1875.

4250. Σ 1138. (6.2...7.0)

R. A. $7^h 39^m 58^s$ Decl. — 14° 24′

A and B

1908.939	338°.2	16″.72
9.164	339.0	16.78
1909.05	338.6	16.75

A and C (9.9)

1908.884	228°.55	100″.67
8.939	228.37	100.46
9.164	228.41	100.11
1909.00	228.44	100.41

The only other measures of C are those given in Part II of the *General Catalogue.* The change in distance corresponds to a proper motion in A of about 0″.06.

The planetary nebula *h* 464 is about $3\frac{1}{2}^m$ preceding. My former measures comparing the central star with one in the nebula, and another following, are given in Pub. Lick. Obsy. II, p. 162.

h 464 (central star) and star *s*

1909.186 211°.6 15″.43

h 464 (central star) and star *f*

1909.186 127°.2 49″.34

4286. OΣ (App.) 89. (6.3...7.0)

R. A. $7^h 43^m 29^s$ Decl. + 31° 55′

1908.102	82°.98	76″.69
.326	82.68	76.84
.689	82.78	76.79
1908.37	82.81	76.77

No change since 1875.

4296. H 431. (9.6...9.6)

R. A. $7^h 44^m 43^s$ Decl. + 30° 7′

1908.102	53°.6	5″.87
11.870	51.4	6.04
1909.98	52.5	5.95

No other measures.

4304. Σ 1153. (9.0...9.2)

R. A. $7^h 45^m 54^s$ Decl. + 12° 20′

1907.118	357°.8	19″.57
.120	357.0	19.77
.997	357.1	19.72
1907.41	357.3	19.69

No measures since 1868. Fixed.

4324. Σ 1155. (8.0...10.7)

R. A. $7^h 47^m 10^s$ Decl. + 26° 29′

1907.788	342°.5	15″.73
10.971	342.9	16.09
11.104	341.2	15.78
1909.95	342.2	15.87

No measures since 1867. Perhaps a little change in distance.

4341. Σ 1158. (8.8...10.0)

R. A. $7^h 49^m 26^s$ Decl. + 22° 12′

A and B

1907.788	332°.7	7″.42
.845	334.4	7.44
1907.82	333.5	7.43

A and C (12.9)

1907.772	258°.3	18″.39
.788	257.5	19.20
.845	257.3	18.73
1907.80	257.7	18.77

In the *General Catalogue* the angle of AC is printed 268°.8; it should be 256°.8.

4342. Hn 92.

R. A. $7^h 49^m 28^s$ Decl. — 16° 20′

1909.170	269°.8	2″.84
.186	272.1	2.86
1909.18	270.9	2.85

The measures of this pair given in Part I of the *General Catalogue* belong to Hn 91 (No. 4217). The early position of Hn 92 is:

1888.24	271°.2	2″.73	3n	Com.

4345. H 433. (11.7...11.7)

R. A. $7^h 50^m 3^s$ Decl. + 23° 58′

1910.739	53°.8	7″.30
.780	50.2	7.50
1910.76	52.0	7.40

No description in H. This is in the right place, and is doubtless the one referred to. About 10′ *n* of H 433 is *h* 473; brighter in the center, but with no definite nucleus.

h 473 and star 10.6 m

1910.739	161°.3	202″.1
.780	161.3	203.1
1910.76	161.3	202.6

4357. Σ 1160. (8.0...11.2)

R. A. $7^h 51^m 41^s$ Decl. + 57° 16′

1907.848	32°.5	5″.92
8.769	32.7	6.41
8.898	33.0	6.24
1908.50	32.7	6.19

No other measures since 1867.

4359. *Ursae Maj.* 2. Sh 86. (6.0...7.0)

R. A. $7^h 51^m 46^s$ Decl. + 63° 25′

1907.120	81°.3	48″.39
.137	81.3	48.26
.140	81.5	48.84
1907.13	81.4	48.50

The proper motion of the principal star (Groombridge 1386) is:

Greenwich	0″.018	in	215°.4
Boss	0.021	in	189.1

B is Groombridge 1388:

Greenwich	0″.039	in	72°.3

4361. 14 *Canis Minoris.* Sh 87. (5.5...9.0)

R. A. $7^h 52^m 8^s$ Decl. + 2° 33′

A and B

1906.906	75°.5	86″.00
.928	75.6	85.88
.964	75.7	86.01
1906.93	75.6	85.96

A and C (9.1)

1906.906	151°.0	117″.46
.928	150.9	117.61
.964	152.1	117.27
1906.93	151.3	117.45

A and D (12.0)

1906.906	284°.8	119″.99
.928	284.7	120.58
.964	284.7	119.76
1906.93	284.7	120.11

A very accurate value of the proper motion of A can be found from the continued measures of the three companion stars. C is DM (2°) 1834.

The proper motion of the principal star is:

Auwers	0″.203	in	294°.8
Porter	0.209	in	298.9
Boss	0.195	in	296.6

4363. Σ 1168. (8.0...11.8)

R. A. $7^h\ 52^m\ 22^s$ Decl. + 5° 57′

1906.906	217°.6	6″.07
.924	217.7	6.38
.966	218.6	6.00
1906.93	218.0	6.15

Perhaps a little change in the angle.

4365. Σ 1165. (8.0...10.3)

R. A. $7^h\ 52^m\ 41^s$ Decl. + 54° 57′

AB and C (10.8)

1910.835	277°.63	216″.95
.856	277.53	216.89
1910.85	277.58	216.92

Evidently the close pair has no sensible proper motion.

1881.03 277°.51 216″.57 2n Bl.

4366. Σ 1159 *rej.* (7.4...9.9)

R. A. $7^h\ 52^m\ 45^s$ Decl. + 72° 8′

1910.856	96°.0	35″.23
.895	94.9	35.29
.931	96.0	35.27
1910.89	95.6	35.26

Never previously measured.

4475. Σ 1195. (8.3...10.8)

R. A. $8^h\ 5^m\ 10^s$ Decl. + 30° 49′

A and B

1909.821	332°.0	8″.80
10.093	331.8	8.94
10.107	331.9	8.78
1910.01	331.9	8.84

A and C (13.0)

1910.093	150°.8	23″.57
.128	150.9	23.15
1910.11	150.8	23.36

Change in AC?

4477. ζ *Cancri.*

R. A. $8^h\ 5^m\ 20^s$ Decl. + 18° 1′

C and β 1243

1909.782	Δ Decl. + 103″.71
09.859	103.20
10.107	103.09
10.109	103.51
10.148	102.96
10.167	102.78
1910.03	+ 103.21

There is nothing in these measures, which were commenced in 1891, to indicate any variable motion in C. Recent spectroscopic observations of that star, made at the Yerkes Observatory, give the same result. The prior measures are all given in Part II of the *General Catalogue.*

4501. Σ 1193. (6.0...9.0)

R. A. $8^h\ 7^m\ 28^s$ Decl. + 72° 47′

A and B

1911.755	87°.05	43″.69
11.950	86.80	43.40
12.008	87.00	43.50
1911.90	86.95	43.56

The proper motion given in the *General Catalogue,* Part II, p. 1071, belongs to another star. The movement of A from meridian position is given:

Auwers	0″.054	in	202°.7
Boss	0.027	in	173.4
Gr. (1900)	0.024	in	199.2

The measures of the small star by Σ, Δ and β (1831-1911) give a different direction:

0″.020 in 29°.6

There is no probability of any motion in the companion which would substantially change this result; but I have connected a 12 m star for future comparison.

B and C

1911.755	2°.57	54″.91
.950	2.37	54.51
1911.85	2.47	54.71

4506. H 2435. (10½...11)

R. A. $8^h\ 7^m\ 45^s$ Decl. — 5° 24′

1911.796	204°.1	7″.08
12.066	207.1	7.33
1911.93	205.6	7.20

H 2435 is in *h* 496. Only recent measures.

4529. β *Cancri.* β 1065. (3.7...13.7)

R. A. 8h 10m 0s Decl. + 9° 33′

A and B

1910.203	294°0	29″24
.206	293.7	29.21
.260	294.5	29.21
1910.22	294.1	29.22

The small star is moving in space with the other.

A and DM (9°) 1922

1875	Δ R. A. 69s7	Δ Decl. 70″77	A. G. Leip.
1910.16	69.5	70.15	β

A and DM (9°) 1926

1875	Δ R. A. 100s4	Δ Decl. 66″6	A. G. Leip.
1910.16	100.4	66.4	β

The proper motion of β *Cancri* is:

Auwers	0″074	in	237°2
Newcomb	0.074	in	224.6
Boss	0.075	in	223.8

4531. Σ 1211. (8.7...9.2)

R. A. 8h 10m 23s Decl. + 39° 22′

A and DM (39°) 2084 (9.3)

1910.128	131°20	95″80
.145	131.41	95.68
.148	131.23	95.91
1910.14	131.28	95.80

From the *Astrographic Catalogue* we have:

1894.30 130°9 92″34 Donner.

Therefore from the two positions the proper motion of A is:

0″209 in 322°1

If there is an error in Porter of the sign in declination, his position-angle would be 325°4.

Porter 0″237 in 214°6

4550. OΣ (App.) 91. (6.6...7.5)

R. A. 8h 11m 50s Decl. + 35° 25′

A and B

1911.104	221°58	92″10
.107	221.58	92.02
.142	221.10	91.97
.145	221.96	91.89
1911.12	221.55	92.00

From the three positions (1875-1911) we have for the apparent motion of A:

0″185 in 39°4

This is confirmed by the relative positions in A. G. and Lalande. As a further check I have connected a very faint star:

A and *a* (13.5)

1911.142	212°3	34″15
.145	213.3	33.83
1911.14	212.8	33.99

4565. OΣ (App.) 92. (7.5...9.0)

R. A. 8h 14m 14s Decl. + 57° 48′

1911.104	180°00	57″43
.107	180.55	57.44
.142	179.80	57.86
1911.12	180.12	57.58

Perhaps a little change in angle.

4588. OΣ 191 *rej.* (7.0...8.3)

R. A. 8h 17m 52s Decl. + 20° 32′

1911.950	190°73	37″39
12.008	191.28	37.43
12.046	191.20	37.40
1912.00	191.07	37.41

No change since 1867; *h* 504 is about 20′ *nf;* small and faint.

4597. φ *Cancri.* S 566. (6.0...11)

R. A. 8h 19m 10s Decl. + 28° 17′

1910.777	20°55	129″38
10.931	20.75	129.46
11.088	21.03	129.25
1910.93	20.78	129.36

If the position by South in 1825 is substantially correct, the proper motion of φ *Cancri* should be:

0″096 in 190°4

The proper motion of the large star from the star catalogues is:

Auwers	0″133	in	208°5
Boss	0.135	in	193.1

4600. H VI. 109. (6.0...10.2)

R. A. 8h 19m 29s Decl. + 7° 57′

1911.775	342°4	31″47
.796	342.0	31.64
.942	342.3	31.37
1911.84	342.2	31.49

Further measures are needed for the proper motion of A, which is obviously very small. From meridian positions:

Boss 0″043 in 263°4

4609. o *Ursae Majoris.* β 1067. (3.4...15.2)

R. A. $8^h 20^m 17^s$ Decl. + 61° 7′

A and C (10.0)

1907.197	151°.1	143″.28
.217	150.8	143.22
1907.21	150.95	143.25

A and D (10.7)

1907.197	207°.3	175″.20
.217	207.4	175.28
1907.21	207.35	175.24

These positions compared with a mean of the measures by Engelhardt give for the proper motion of the large star:

Measures of C	0″.230	in	226°.5
Measures of D	0.156	in	258.0

These measures should be continued. The motion of the large star from the catalogues is:

Auwers	0″.176	in	229°.8
Newcomb	0.162	in	225.7
Boss	0.166	in	226.8

4614. H 448. (8.7...11.6)

R. A. $8^h 20^m 33^s$ Decl. + 21° 51′

1909.838	324°.7	31″.27
.859	325.5	31.08
.936	324.8	31.59
1909.88	325.0	31.31

No other measures. The object in the field, *h* 506, referred to by Herschel, was not noticed.

4618. H 2445. (8.5...12.9)

R. A. $8^h 20^m 43^s$ Decl. + 52° 27′

1907.140	158°.1	44″.22
8.063	157.7	43.74
8.788	158.2	43.72
1908.00	158.0	43.89

No other measures. The principal star is given a small proper motion:

A. G. Harv. 0″.041 in 0°

4648. Σ 1236. (8.0...8.5)

R. A. $8^h 23^m 57^s$ Decl. + 32° 20′

1907.102	113°.5	36″.48
7.140	114.2	36.58
8.288	114.0	36.55
1907.51	113.9	36.54

One of these stars has a small proper motion of 0″.026 in 227°.0 (± 180°).

4658. S 569. (8.1...9.2)

R. A. $8^h 25^m 13^s$ Decl. — 25° 38′

1909.167	339°.07	29″.37
.170	338.43	29.14
.186	339.15	29.14
1909.17	338.88	29.22

My measures indicate a proper motion in declination for one of the stars of about 0″.1. The distance by South in 1825 is much too large.

4660. Σ 1240. (7.2...10.2)

R. A. $8^h 25^m 37^s$ Decl. + 33° 50′

A and B

1908.898	74°.6	24″.85
8.900	74.7	24.77
9.093	76.4	24.70
1908.96	75.2	24.77

The four positions of AB by Σ, Δ, Doo and β (1830-1908) give for the proper motion of A:

0″.042 in 288°.1

A and C (10.0)

1908.882	245°.90	51″.75
.898	245.80	51.39
.900	245.70	51.16
1908.89	245.80	51.43

A comparison of this with the measure of 1898 by Doolittle gives practically the same proper motion for A.

4677. Σ 1245. (6.0...7.0)

R. A. $8^h 29^m 29^s$ Decl. + 7° 2′

A and C (10.8)

1910.164	119°.50	93″.08
.184	119.47	93.18
.203	119.48	93.26
1910.18	119.48	93.17

A and D (10.7)

1910.164	282°.00	117″.48
.184	282.07	117.05
.203	281.82	116.62
1910.18	281.96	117.05

A and E (9.7)

1910.164	210°.80	129″.05
.184	210.77	129.28
.203	210.48	129.23
1910.18	210.68	129.19

The time interval of 17 years should be extended for the best result. From these measures we have for the proper motion of A:

AC	R. A. — 0″.127	Decl. — 0″.109
AD	0.214	0.139
AE	0.165	0.085
	— 0.169	— 0.111

Therefore the proper motion of the large star is:

0″.202 in 236°.7

Other values from meridian positions are:

Porter	0″.172	in	230°.9
Boss	0.195	in	219.8

4710. Σ 1254. (6.5...9.0)

R. A. $8^h\ 33^m\ 29^s$ Decl. + 20° 6′

A and B

1906.906	54°.8	20″.22
7.006	54.4	19.99
7.022	53.4	20.38
1906.98	54.2	20.20

A and C (8.5)

1906.906	341°.1	63″.39
7.006	342.2	62.88
7.022	341.8	62.89
1906.98	342.0	63.05

A and D (9.0)

1906.906	43°.4	82″.50
7.006	43.2	82.53
7.022	43.7	82.37
1906.98	43.4	82.47

No other measures of the small stars, C and D. From the catalogues the motion of A is:

Boss	0″.042	in	238°.0
A. G. Ber.	0.056	in	270.0

4727. Σ 1261. (7.5...10.2)

R. A. $8^h\ 35^m\ 1^s$ Decl. — 11° 30′

1910.148	302°.5	29″.45
.164	302.6	29.34
.203	302.6	29.77
1910.17	302.6	29.52

No measures since 1867. No sensible motion.

4753. Σ 1259. (8.5...9.0)

R. A. $8^h\ 38^m\ 51^s$ Decl. + 38° 56′

1910.148	341°.9	4″.93
.164	342.4	5.04
.203	341.8	4.92
1910.17	342.0	4.96

No measures since 1867.

4758. Ho 251. (8.5...12.2)

R. A. $8^h\ 39^m\ 3^s$ Decl. + 25° 45′

1907.102	150°.0	3″.58
9.227	151.2	3.56
1908.16	150.6	3.57

Probably fixed.

4761. Σ 1269. (9.5...9.6)

R. A. $8^h\ 39^m\ 21^s$ Decl. + 19° 41′

1906.796	308°.0	11″.50
7.022	309.4	11.60
7.102	309.4	11.47
1906.97	308.9	11.52

The quadrant given by Dembowski is correct.

4778. Σ 1274. (7.0...8.7)

R. A. $8^h\ 41^m\ 16^s$ Decl. + 38° 47′

1910.148	40°.1	8″.73
.164	41.6	9.03
.203	40.0	8.70
1910.17	40.6	8.82

No measures since 1867.

4807. H 459. (11.2...11.2)

R. A. $8^h\ 43^m\ 41^s$ Decl. + 31° 18′

A and B

1910.931	94°.5	15″.78
11.107	95.9	15.64
1911.02	95.2	15.71

H 459 and *h* 529

1910.93 Δ R. A. $+ 32^s.1$ Δ Decl. — 60″.7

This is referred to by Herschel in the note given in Part I of the *General Catalogue*.

4815. Σ 1280. (7.5...7.6)

R. A. $8^h\ 44^m\ 22^s$ Decl. + 71° 16′

A and B

1910.049	44°.8	4″.66
.107	45.8	4.81
1910.08	45.3	4.73

These stars make a system of the 61 *Cygni* type.

B and C (10.6)

1910.049	94°.13	256″.27
.093	94.05	256.52
.107	94.17	257.26
1910.08	94.12	256.68

The only other measures of this are:

1879.67	97°.65	217″.41	3n	Bl.

From these measures (1879-1910) we have for the proper motion of the larger star:

1″.377 in 255°.5

From meridian observations the proper motion of A is:

Kustner	1″.371	in	254°.4
Porter	1.399	in	255.9

4821. Σ 1287. (8.0...10.3)

R. A. $8^h 44^m 53^s$ Decl. + 12° 35′

A and C (12.6)

1906.906	106°.1	15″.10
.928	105.3	14.96
.966	105.1	15.35
1906.93	105.5	15.14

The small star is not in Struve. The only other measure disagrees in angle:

1900.28	117°.0	15″.15	2n	Doo

4844. Ho 357. (6.5...13.0)

R. A. $8^h 47^m 48^s$ Decl. + 26° 40′

1906.906	6°.2	37″.16
7.022	5.8	37.00
7.102	5.2	37.38
1907.01	5.7	37.18

Change uncertain. Ristenpart (4245) gives the proper motion of the large star:

0″.433 in 172°.9

4863. Σ 1293. (7.8...9.0)

R. A. $8^h 50^m 35^s$ Decl. + 54° 26′

1908.898	92°.2	18″.85
.900	92.1	18.54
.920	92.1	18.49
1908.91	92.1	18.63

No other measures since 1866.

4866. ι *Ursae Maj.* Hu 628.

R. A. $8^h 50^m 59^s$ Decl. + 48° 31′

B and C (9.5...9.8)

1909.206	187°.7	0″.68
.227	186.9	0.58
1909.22	187.3	0.63

Motion in angle, and certainly a binary system.
The proper motion of the large star is:

Auwers	0″.503	in	240°.6
Newcomb	0.500	in	240.1
Boss	0.502	in	240.3

4883. 66 *Cancri.* Σ 1298. (6.1...8.2)

R. A. $8^h 54^m 3^s$ Decl. + 32° 43′

A and C (11.1)

1908.882	318°.95	187″.15
.898	319.03	187.65
.974	318.93	187.20
1908.92	318.97	187.33

The first measures are discordant in distance:

1879.31	319°.27	188″.08	1n	Bl
1879.83	318.73	187.07	1n	Bl.

The proper motion of 66 *Cancri* is very uncertain:

Auwers	0″.039	in	324°.6
Boss	0.007	in	225.3

4891. 67 *Cancri.* Sh 101. (6.3...9.0)

R. A. $8^h 54^m 39^s$ Decl. + 28° 23′

1908.843	325°.33	101″.93
.862	324.93	101.65
.882	325.13	101.96
1908.86	325.13	101.85

No third star available. The smaller star appears to be moving with the other. The proper motion is:

Auwers	0″.119	in	218°.0
Boss	0.105	in	213.4

4923. σ^2 *Ursae Maj.* Σ 1306. (5.0...8.2)

R. A. $8^h 59^m 50^s$ Decl. + 67° 37′

A and C (9.4)

1908.766	148°.10	205″.13
.769	147.83	205.04
.788	148.23	204.76
1908.77	148.05	204.98

The following is corrected for error of 180° in the angle:

1879.55	147°.97	206″.31	2n	Bl.

The measures of the small star should be continued for the proper motion of σ^2 *Ursae.* This from the catalogue is:

Auwers	0″.064	in	179°.0
Boss	0.070	in	183.9
Newcomb	0.066	in	181.1

4950. Σ 1304. (8.2...9.0)

R. A. $9^h 3^m 16^s$ Decl. + 81° 53′

1908.785	319°.4	24″.13
10.128	319.1	24.20
1909.46	319.2	24.16

No other measures since 1867.

4972. Σ 1321. (7.4...7.4)

R. A. $9^h 6^m 23^s$ Decl. + 53° 13′

A and C (10.0)

1909.109	196°.43	155″.02
.112	196.30	154.34
.128	196.73	154.42
1909.12	196.49	154.59

This is a system of the 61 *Cygni* class. The only other measures are:

1879.57	208°.27	188″.86	2n	Bl.

The proper motion of A from these measures, and from meridian positions is:

Measures (AC)	1″.667	in	247°.8
Stumpe	1.668	in	247.3
Paris	1.670	in	249.2
Porter	1.702	in	248.9
A. G. Harv.	1.711	in	249.1

4984. *θ Hydrae.* H 2489. (4.0...10.6)

R. A. $9^h 8^m 8^s$ Decl. + 2° 49′

1910.931	181°.28	42″.31
11.107	181.84	41.89
11.142	181.68	42.65
11.162	181.37	42.25
1911.09	181.54	42.28

The proper motion of *θ Hydrae* from some of the meridian positions is too small. From all the measures of B (1853-1911) we have:

0″.382 in 153°.4

From meridian positions:

Auwers	0″.318	in	159°.0
Newcomb	0.339	in	156.9
Boss (G. C.)	0.338	in	157.3

4986. H 1165. (8.3...12.0)

R. A. $9^h 8^m 26^s$ Decl. + 45° 26′

1907.140	117°.5	25″.57
9.109	116.8	25.53
9.164	116.2	25.57
1908.47	116.8	25.56

No other measures. *h* 563 which is on the same parallel, and about 4^m *p* H 1165, is too diffused for accurate comparison with any star in the field.

4993. Weisse 21. (7.7...8.9)

R. A. $9^h 9^m 1^s$ Decl. —8° 16′

1907.197	14°.4	25″.90
7.997	14.3	25.95
8.249	14.3	25.87
1907.81	14.3	25.91

No change since 1880.

4994. OΣ 198 *rej.* (8.0...12.5)

R. A. $9^h 9^m 17^s$ Decl. + 23° 54′

1907.022	157°.2	14″.95
.102	157.2	14.62
.137	158.0	14.59
1907.09	157.5	14.72

Change in angle and distance from the proper motion of A. The measures should be continued after the proper time interval.

4995. H 2491. (11.1...11.2)

R. A. $9^h 9^m 21^s$ Decl. + 35° 1′

1912.066	202°.0	15″.37
.197	200.6	15.03
1912.13	201.3	15.20

Disagrees with H's estimated angle; nothing else found. About 5′ *sp* H 2491 is *h* 572; faint and round.

4999. Σ 1329. (8.3...8.5)

R. A. $9^h 9^m 37^s$ Decl. — 0° 44′

A and B

1910.931	250°.5	18″.78
11.107	250.4	18.89
11.164	250.2	19.23
1911.07	250.4	18.97

From the measures of AB (1834-1903) one of these stars has some proper motion. The apparent motion of A, considering B as stationary, is:

0″.108 in 216°.0

The only value found from the catalogues is:

A. G. Nico. 0″.09 in 180°

To show whether or not B has any motion, I have connected a faint star.

A and C (12.5)

1910.931	101°.78	157″.56
11.164	101.63	156.56
11.184	101.25	158.17
11.200	101.28	156.87
1911.12	101.48	157.29

5000. H 2492. (10.8...neb.)

R. A. $9^h 10^m 6^s$ Decl. + 53° 1′

H 2492 and *h* 574

1909.780	120°.0	15″.94

Herschel refers to H 2492 as "a double object composed of a star and a very faint nebula with stellar center". The latter is *h* 574. It is a little brighter in the middle, but too indefinite for accurate measures.

H 2492 (star) and DM (53°) 1328

1909.780	127°.9	239″.0

5003. Σ 1332. (7.2...7.5)

R. A. $9^h 10^m 24^s$ Decl. + 24° 9′

1908.974	23°.2	5″.67
9.071	22.4	5.80
1909.02	22.8	5.73
1911.162	23°.2	5″.90
.164	22.9	5.72
.181	21.6	5.67
1911.17	22.6	5.76

The proper motions are given in A. G. Berlin:

A	0″102	in	233°9
B	0.096	in	238.7

This is a system of the 61 *Cygni* type.
No third star available for proper motion.

5006. OΣ (App.) 98. (7.7...8.0)

R. A. 9h 10m 46s Decl. + 7° 46′

A and B

1911.796	169°43	111″59
11.947	169.13	111.64
12.046	169.30	111.06
1911.93	169.29	111.43

As it appears that one of these stars has a small proper motion, I have connected a faint star to determine which of the two is moving.

B and C (13.0)

1911.947	89°30	145″27
12.046	89.50	145.09
1912.00	89.40	145.18

5012. H 128. (7.0...12.2)

R. A. 9h 11m 21s Decl. + 12° 0′

1910.931	280°5	22″66
11.104	280.4	22.97
11.142	279.7	22.78
1911.06	280.2	22.80

Change doubtful.

5014. 38 *Lyncis.* Σ 1334. (4.0...6.7)

R. A. 9h 11m 23s Decl. + 37° 19′

B and C (10.9)

1909.109	212°63	87″64
.112	212.40	87.47
.128	212.43	87.94
1909.12	212.49	87.68

B and D (10.8)

1909.112	257°40	177″02
.128	257.03	177.94
.164	256.97	177.61
1909.13	257.13	177.52

The change in the angle and distance of BD agrees with the proper motion of A. Further measures should be made of this, and the nearer star C.

1879.61	255°85	178″37	2n	Bl.

The large stars have a common proper motion:

Auwers	0″122	in	199°4
Newcomb	0.134	in	187.7
Boss	0.137	in	190.5

5015. Σ 1331. (8.0...8.0)

R. A. 9h 11m 24s Decl. + 61° 51′

AB and E (9.9)

1910.145	223°33	139″73
.148	223.08	139.64
.164	223.20	139.16
1910.15	223.20	139.51

No measures since 1863. No material change in the close pair.

5021. H 126. (8.5...10.7)

R. A. 9h 12m 5s Decl. — 0° 6′

1907.120	32°1	29″15
.137	31.8	28.96
1907.13	32.0	29.05

H's estimated angle is 55° *nf* (= 35°) instead *sf* as printed in the *General Catalogue.*

5023. 37 *Lyncis.* OΣ 199. (6.1...10.2)

R. A. 9h 12m 24s Decl. + 51° 46′

A and C (10.0)

1909.093	5°03	144″39
.109	4.70	144.69
.112	4.80	144.33
1909.10	4.84	144.47

The only other measures of the distant star are:

1886.38	4°08	147″82	2n	Eng
1894.37	4.25	146.81	2n	Eng.

From these positions we have for the corrected proper motion of 37 *Lyncis:*

0″176 in 333°6

From the star catalogues:

Auwers	0″141	in	345°6
Porter	0.153	in	338.7
A. G. Harv.	0.163	in	348.2
Boss	0.140	in	344.2

5030. *Lyncis* 157. Σ 1338. (7.0...7.2)

R. A. 9h 13m 29s Decl. + 38° 42′

AB and C (11.4)

1909.821	167°02	143″76
.933	166.90	144.23
.936	166.72	143.64
1909.90	166.88	143.88

Evidently the proper motion, if any, is very small.

1879.60	167°46	143″15	2n	Bl.

The two positions give for the proper motion of A:

Measures	0″054	in	283°8
Greenwich	0.047	in	262.7

5036. H 810.

R. A. $9^h\ 14^m\ 10^s$ Decl. + 27° 58′

A and B (12.0)

1910.148	359°.7	1″.86
.164	357.6	1.95
.203	360.4	1.71
1910.17	359.2	1.84

A and C (9.1...9.7)

1910.148	31°.8	20″.42
.164	31.8	20.54
.203	31.5	20.60
1910.17	31.7	20.52

The close star is new. No change in AC since 1880.

5038. 39 *Lyncis.* Σ 1340. (6.5...8.3)

R. A. $9^h\ 14^m\ 21^s$ Decl. + 50° 3′

A and C (11.0)

1909.109	82°.69	134″.22
.112	82.97	134.87
.128	82.95	135.27
1909.12	82.87	134.79

The values given of the proper motion of A are inconsistent.

Boss	0″.016	in	239°.4
Auwers	0.023	in	290.7
A. G. Harv.	0.021	in	43.9

The measures of AC give 0″.031 in 19°.4, but as one of the early measures is marked "unsatisfactory", the result is perhaps uncertain, and the measures should be repeated after the proper interval.

1879.57	82°.53	135″.20	2n	Bl.

5058. Σ 1347. (6.7...8.0)

R. A. $9^h\ 17^m\ 1^s$ Decl. + 4° 1′

1906.966	310°.9	21″.36
7.006	310.6	21.19
7.120	310.3	21.02
1907.03	310.6	21.19

No change.

5059. 21 *Ursae Maj.* Σ 1346. (7.0...8.0)

R. A. $9^h\ 17^m\ 8^s$ Decl. + 54° 32′

B and C (11.2)

1908.882	189°.62	96″.73
8.997	189.30	96.43
9.093	190.05	96.41
1908.99	189.66	96.52

The first measures disagree too much in distance:

1879.33	189°.45	97″.39	1n	Bl
1879.83	189.39	98.62	1n	Bl.

The proper motion of A is given:

Auwers	0″.021	in	172°.9
Boss	0.031	in	208.8

5060. Σ 1345. (8.5...10.1)

R. A. $9^h\ 17^m\ 15^s$ Decl. + 64° 52′

1909.227	85°.7	2″.63
10.109	85.4	3.19
10.128	84.2	3.11
1909.82	85.1	2.98

No other recent measures.

5062. ϰ *Leonis.* β 105. (4.9...10.7)

R. A. $9^h\ 17^m\ 40^s$ Decl. + 26° 42′

A and C (10.9)

1912.162	211°.10	152″.39
.164	210.97	151.59
.197	211.50	152.31
1912.17	211.19	152.10

No other measures. The proper motion has been given:

Auwers	0″.057	in	231°.7
Boss	0.061	in	210.2

5067. OΣ 202 *rej.* (8.5...13)

R. A. $9^h\ 18^m\ 1^s$ Decl. + 30° 4′

1911.164	197°.9	17″.16
.184	198.1	17.43
.219	199.3	17.38
1911.19	198.4	17.32

Only recent measures of this.
h 602 is $5^m\ 20^s$ exactly *f;* small, with central condensation.

h 602 and DM (30°) 1864 (8.6)

1911.164	49°.3	190″.0
.219	49.5	189.2
1911.19	49.4	189.6

5075. Hd 123. (8.0...10.6)

R. A. $9^h\ 18^m\ 24^s$ Decl. — 23° 9′

1907.137	6°.4	4″.25
7.197	4.6	4.28
9.170	6.0	4.35
1907.83	5.7	4.29

No other complete measures.

5076. Hn 98. (9.8...9.8)

R. A. $9^h\ 18^m\ 56^s$ Decl. $-23°\ 17'$

1907.137	173°.6	2″.82
9.170	172.1	3.11
1908.15	172.8	2.96

5082. Arg. 22. (9.4...9.5)

R. A. $9^h\ 19^m\ 45^s$ Decl. $-23°\ 6'$

1907.137	98°.9	23″.52
7.197	98.0	23.68
9.170	97.7	23.55
1907.83	98.2	23.58

No other measures.

5084. H. C. Wilson 7.

R. A. $9^h\ 20^m \pm$ Decl. $-23°\ 10' \pm$

This was searched for in observing No. 5076, but nothing found near the rough place given by Wilson agreeing with the description.

5090. 41 *Lyncis.* S 598. (5.7...7.5)

R. A. $9^h\ 20^m\ 48^s$ Decl. $+46°\ 8'$

A and C (10.4)

1908.997	79°.53	82″.99
9.093	79.83	83.63
9.109	79.37	83.25
9.128	79.63	83.42
1909.08	79.59	83.32

We have the following earlier positions of C:

1879.62	80°.57	83″.39	2n	Bl
1888.30	80.60	83.58	2n	Eng
1893.19	80.70	83.51		Donner.

The last is from the *Astrographic Catalogue.* The micrometer positions give for the proper motion of 41 *Lyncis:*

0″.060 in 186°.7

It will be noted that this value derived from the measures of a faint star is practically the same as that found from sixty years' measures of AB, and implies that the meridian proper motion of A is much too large.

Measures of AB	0″.087	in	178°.3
Auwers	0.133	in	187.3
Porter	0.138	in	192.6
Boss	0.136	in	181.3

5093. Σ 1349. (6.8...8.0)

R. A. $9^h\ 20^m\ 58^s$ Decl. $+68°\ 4'$

1907.140	164°.8	19″.43
8.227	164.7	18.85
8.249	164.5	19.07
1907.87	164.7	19.12

No recent measures. Fixed.

5104. 23 *Ursae Maj.* Σ 1351. (3.8...9.0)

R. A. $9^h\ 22^m\ 3^s$ Decl. $+63°\ 35'$

A and C (10.5)

1908.766	227°.94	93″.51
.769	227.88	93.26
.788	228.40	93.07
.826	227.65	93.34
1908.79	227.97	93.29

Prior measures for comparison are:

1886.39	227°.33	90″.60	1n	Eng.
1894.40	227.87	92.32	1n	Eng.

The three positions give for the proper motion of 23 *Ursae Maj.:*

0″.105 in 65°.5

Ball has two measures in 1879, but as the distances differ by more than 1″, they are not used in the computation. No change in AB.

Auwers	0″.104	in	75°.5
Boss	0.117	in	77.6

5113. 7 *Leonis Min.* H 1166. (6.0...9.3)

R. A. $9^h\ 23^m\ 28^s$ Decl. $+34°\ 11'$

1911.950	129°.33	62″.83
12.007	128.88	62.87
12.046	129.30	62.55
1912.00	129.17	62.75

There is no sensible change since 1876. Herschel's distance in 1783 is much too small. The proper motion of A is given:

Auwers	0″.057	in	206°.0
Boss	0.065	in	186.5

As these stars appear to have a common proper motion, I have connected a third for future confirmation of this movement.

A and C (9.8)

1911.950	213°.33	97″.82
12.007	213.05	97.85
12.046	213.07	97.70
1912.00	213.15	97.79

5116. Σ 1360. (7.4...7.7)

R. A. $9^h\ 24^m\ 10^s$ Decl. $+11°\ 8'$

A and B

1910.164	243°.1	14″.45
.167	242.7	14.31
.184	243.2	14.42
1910.17	243.0	14.39

The proper motions of the large stars are given:

A = 0″.222	in	262°.4	Bossert
0.228	in	261.7	Glasgow
B = 0.246	in	243.5	Bossert
0.251	in	243.8	Glasgow

As there has been no relative change in these stars in 80 years, obviously the motions must be exactly the same. In this connection I have measured two small stars for the proper motion of AB.

A and C (12.0)

1910.164	69°.97	82″.16
.203	70.15	81.75
1910.18	70.06	81.95

A and D (10.8)

1910.167	57°.23	157″.82
.184	57.24	158.16
.203	57.15	157.81
1910.18	57.21	157.93

About 1° *sf* are two small faint nebulae, not well defined for measurement.

h 608 and star 10.5 m

1910.164	126°.4	197″.0
.203	125.4	194.3
1910.18	125.9	195.6

h 609 and same star

1910.164	296°.9	99″.6
.203	295.2	98.2
1910.18	296.0	98.9

5124. Σ 1364. (7.7...9.2)

R. A. $9^h 24^m 59^s$ Decl. + 20° 32′

A and B

1909.206	155°.2	16″.36
.227	155.0	16.40
.263	154.8	16.50
1909.23	155.0	16.42

A and C (11.0)

1909.206	301°.82	41″.33
.227	301.95	41.23
.263	302.35	41.56
1909.23	302.04	41.37

The principal star (Lalande 18708) is given some proper motion:

A. G. Ber. 0″.118 in 201°.0

There is no change in AB. If these stars have any such movement, it will soon appear in the measures of the small star. The principal star is DM (20°) 2334 and not 2332 as given in Part I of the *General Catalogue.*

5129. β 909. (7.2...12.0)

R. A. $9^h 25^m 25^s$ Decl. + 22° 23′

1909.112	91°.1	5″.94
.170	87.6	6.01
.186	89.5	5.51
1909.16	89.4	5.82

No material change since 1879. About 20′ *s* is *h* 604, but it is too large and diffused for accurate comparison with any of the stars in the field.

5131. 6 *Leonis.* Sh 107. (5.0...9.5)

R. A. $9^h 25^m 32^s$ Decl. + 10° 15′

1909.263	74°.30	37″.43
.299	74.45	36.90
1909.28	74.38	37.16

The proper motion of the large star is wholly uncertain. Further measures of the small star will give this movement.

Auwers	0″.011	in	320°.7
Boss	0.024	in	197.8

5134. H N. 29. (6.0...11)

R. A. $9^h 26^m 17^s$ Decl. + 28° 54′

1911.950	257°.97	31″.75
12.046	258.67	31.82
12.066	258.15	31.95
1912.02	258.26	31.84

The principal star has a small proper motion. The six positions by OΣ, Ho, Doo and β (1840-1912) give:

0″.055 in 241°.6

As the two positions by OΣ are each on a single night, further measures should be made for a final value of the proper motion. No proper motion found in the star catalogues referred to.

5145. Σ 1369. (7.0...8.0)

R. A. $9^h 27^m 53^s$ Decl. + 40° 30′

A and B

1908.025	147°.7	24″.70
.082	148.8	24.51
.249	149.3	24.77
1908.12	148.6	24.66

A and C (7.5)

1908.025	324°.38	117″.24
.082	324.20	117.54
.249	324.13	117.56
1908.12	324.24	117.45

No other late measures.

5149. OΣ (App.) 102. (7.7...8.7)

R. A. $9^h 28^m 36^s$ Decl. + 14° 37′

1912.867	42°.50	48″.93
.884	42.63	48.75
.890	43.00	49.25
1912.88	42.71	48.98

One of these stars appears to have a small proper motion; the distance is slowly decreasing.

5152. Σ 1371. (8.0...10.5)

R. A. 9ʰ 29ᵐ 10ˢ Decl. + 4° 27′

A and C (11.8)

1910.206	270°.17	121″.34
.225	270.30	121.41
.260	269.83	121.61
1910.23	270.10	121.45

For proper motion of AB.

Bossert 0″.111 in 214°.4

5175. 14 *Leonis.* H VI. 76. (4.0...9.3)

R. A. 9ʰ 34ᵐ 45ˢ Decl. + 10° 26′

1909.170	42°.83	83″.96
.206	42.95	84.22
.227	43.02	83.94
.299	42.95	83.81
1909.23	42.94	83.98

The distance by Herschel in 1783 is much too small. The four measures by Eng and β (1881-1909) give for the proper motion of 14 *Leonis:*

0″.135 in 261°.9

From the star catalogues we have:

Auwers	0″.159	in	262°.4
Boss	0.150	in	254.9

About 3ᵐ *f* and 23′ *s* is the nebula *h* 614. This is too indefinite for accurate comparison with any small star.

5195. *Leonis* 61. Σ 1379. (7.5...11.2)

R. A. 9ʰ 38ᵐ 54ˢ Decl. + 9° 26′

1907.120	174°.9	9″.71
.137	172.6	9.65
.140	174.1	9.67
1907.13	173.9	9.68

No material change since 1830.

5219. OΣ 207 *rej.* (7.7...10.8)

R. A. 9ʰ 43ᵐ 17ˢ Decl. + 17° 24′

1910.206	322°.0	20″.23
.225	321.8	20.36
.244	322.3	20.52
1910.22	322.0	20.37

The principal star has a small proper motion of about 0″.025 in the position-angle of BA.

5225. OΣ (App.) 103. (8.5...9.0)

R. A. 9ʰ 44ᵐ 13ˢ Decl. + 19° 53′

A and B

1908.022	124°.87	78″.54
.025	124.70	78.80
.063	125.01	78.46
1908.04	124.86	78.60

The three measures (1875-1908) give a proper motion to one of these stars:

0″.069 in 26°.1 (± 180°)

As this motion may be in either, I have connected with each a 10.2 m star:

A and C

1908.102	177°.97	95″.61
.156	177.78	95.72
.159	177.72	95.65
1908.14	177.82	95.66

B and C

1908.102	230°.33	79″.43
.156	229.78	79.18
.159	230.25	79.62
1908.14	230.12	79.41

5227. OΣ 522. (7.3...11.0)

R. A. 9ʰ 44ᵐ 39ˢ Decl. + 65° 21′

1907.140	123°.4	14″.74
8.079	123.2	14.58
8.249	123.3	14.66
1907.82	123.3	14.66

Change uncertain.

5280. H 149. (8.3...11.0)

R. A. 9ʰ 54ᵐ 46ˢ Decl. + 5° 36′

1907.006	266°.7	30″.96
.120	266.2	31.07
1907.06	266.4	31.01

This is DM (5°) 2269; only yellowish.
No other measures.

5285. H 472.

R. A. 9ʰ 56ᵐ 2ˢ Decl. + 27° 57′

A and B (8.6...8.6)

1907.022	119°.2	9″.84
.120	120.1	9.40
1907.07	119.6	9.62

A and C (12.6)

1907.022	141°.1	28″.24
.120	140.1	27.90
1907.07	140.6	28.07

No other measures.

5291. H 2517. (7.2...12.0)

R. A. $9^h\ 56^m\ 44^s$ Decl. + 38° 36′

1911.107	152°.7	44″.18
.142	152.7	44.45
.145	153.4	44.47
1911.13	152.9	44.37

It is evident the small star does not belong to the other. The proper motion of A is given:

Porter 0″.202 in 229°.1

A continuation of the measures will give an independent value.

5320. S 607. (8.5...9.7)

R. A. $10^h\ 0^m\ 56^s$ Decl. — 18° 44′

1911.222	145°.9	9″.82
12.274	145.2	9.75
1911.75	145.5	9.78

The apparent change in distance since 1825 requires confirmation. The only other more recent measures are discordant. In a low-power field *nf* is *h* 3226. This is too faint and indefinite for accurate measures.

5332. Σ 1411 *rej.* (8.7...10)

R. A. $10^h\ 2^m\ 15^s$ Decl. + 32° 57′

1911.104	307°.7	35″.28
.107	307.8	34.93
1911.11	307.7	35.10

The only other position is photographic:

1894.31	306°.7	35″.31	Scheiner

5334. β 911. (7.5...11.2)

R. A. $10^h\ 2^m\ 41^s$ Decl. — 19° 10′

A and C (9.3)

1910.128	73°.47	53″.59
.148	73.48	53.49
.184	73.20	53.27
1910.15	73.38	53.45

From all the measures of AC (1880-1910) the corrected proper motion of AB is:

0″.354 in 204°.7

The motion derived from meridian observations is given:

Radcliffe	0″.364	in	195°.8
Porter	0.365	in	207.2

5337. Σ 1412 *rej.* (8.0...10.0)

R. A. $10^h\ 3^m\ 29^s$ Decl. + 3° 45′

A and B

1910.184	295°.8	30″.81
.186	295.4	30.86
.203	295.4	30.34
1910.19	295.5	30.67

A and DM (3°) 2324 (8.7)

1910.184	49°.44	96″.21
.186	49.32	96.04
.203	48.95	96.05
1910.19	49.24	96.10

If the meridian places are correct, there is some motion in one of these stars:

1875	48°.0	98″.7	A. G. Alb.

About 4^m *f* and a little *n* are two small nebulae.

h 684 and star 11.5 m

1910.206	330°.8	161″.78
.244	331.4	162.67
1910.22	331.1	162.22

h 685 and star 10.6 m

1910.203	79°.05	89″.07
.206	79.20	88.94
.244	78.75	88.99
1910.22	79.00	89.00

Other observations of this are:

1875.28	77°.9	89″.8	1n	Wn
1892.25	78.8	84.8	1n	Eng.

5342. λ *Hydrae.* β 593. (3.8...13.5)

R. A. $10^h\ 4^m\ 44^s$ Decl. — 11° 46′

1910.206	115°.63	55″.68
10.280	115.30	55.72
11.222	115.50	56.01
1910.57	115.48	55.80

Omitting my position of 1878, which is from a single night, the three measures on 8n give for the proper motion of λ *Hydrae:*

0″.210 in 241°.7

From meridian observations:

Auwers	0″.229	in	251°.7
Boss	0.222	in	245.2
Newcomb	0.219	in	246.3

5343. (10.5...10.5)

R. A. $10^h\ 4^m\ 54^s$ Decl. + 10° 36′

1907.022	185°.7	73″.30
.102	185.7	73.56
1907.06	185.7	73.43

5356. Σ 1415. (6.1...7.0)

R. A. $10^h 8^m 11^s$ Decl. + 71° 40′

A and C (10.0)

1909.148	10°.23	150″.00
.170	10.10	149.65
.186	10.89	149.49
1909.17	10.41	149.71

I do not find any proper motion given A from meridian observations. The only direct measures are:

1879.55 9°.64 148″.57 2n Bl.

Further measures should be made.

5376. H 3324. (9.4...9.9)

R. A. $10^h 11^m 19^s$ Decl. + 68° 44′

1907.140	199°.5	18″.58
.197	199.0	18.62
1907.17	199.2	18.60

Probably unchanged.

5418. β 1322. (7.0...13.3)

R. A. $10^h 18^m 1^s$ Decl. + 2° 59′

A and C (7.0)

1911.107	64°.00	208″.50
.142	64.12	209.29
.181	64.28	209.01
.184	64.23	209.23
1911.15	64.16	209.01

No suitable third star to connect with either. From a comparison of the A. G. and β positions of AC, one of these stars has a proper motion of 0″.106 in 80°.5 (± 180°)

5430. Σ 1433 *rej.* (8.6...10.4)

R. A. $10^h 20^m 20^s$ Decl. — 3° 26′

1907.137	262°.5	23″.59
.197	262.2	23.28
.258	262.2	22.77
1907.20	262.3	23.21

No other measures.

5436. 45 *Leonis.* H 832. (6.2...12.1)

R. A. $10^h 21^m 18^s$ Decl. + 10° 23′

1911.107	131°.10	37″.84
.142	131.55	38.75
.162	131.80	38.52
1911.14	131.48	38.37

Further measures needed for the proper motion of A.

Auwers	0″.022	in	312°.7
Boss	0.014	in	120.7

5441. Σ 1438 *rej.* (9.0...11.0)

R. A. $10^h 22^m 7^s$ Decl. + 13° 47′

1910.186	248°.1	15″.17
.203	247.4	15.06
.206	248.0	14.80
1910.20	247.8	15.01

The DM number in Part I of the *General Catalogue* should be 2265 instead of 2261. No early measures.

5451. Σ 1440. (8.0...9.5)

R. A. $10^h 23^m 45^s$ Decl. — 3° 18′

1909.206	347°.2	15″.20
.227	347.1	15.27
.244	347.0	15.20
1909.23	347.1	15.22

No other recent measures.

5466. H 2534. (5.7...12.3)

R. A. $10^h 26^m 14^s$ Decl. + 41° 2′

1910.206	322°.7	22″.81
.222	322.9	22.53
.225	324.1	22.61
1910.22	323.2	22.65

The measures, 1879-1910, should give a very accurate value of the proper motion of the principal star:

0″.117 in 261°.6

Other values are:

Groombridge	0″.158	in	272°.5
Boss	0.142	in	267.2
Bossert	0.113	in	270.0

5470. Σ 1445. (8.8...11.8)

R. A. $10^h 26^m 35^s$ Decl. — 0° 15′

1907.137	160°.2	2″.66
.197	158.9	2.70
.258	160.6	2.99
1907.20	159.9	2.78

No material change.

5475. Σ 1444 *rej.* (8.2...10.6)

R. A. $10^h 27^m 27^s$ Decl. + 64° 13′

1907.140	266°.0	17″.59
10.091	266.2	17.78
10.093	266.5	18.04
1909.11	266.2	17.80

No other measures.

5477. S 610. (8.3...8.5)

R. A. $10^h\ 28^m\ 3^s$ Decl. — 17° 13′

1907.271	43°.5	105″.43
8.192	42.9	105.21
8.214	42.9	105.07
1907.89	43.1	105.24

Change from proper motion. Further measures should be made. The meridian positions give:

1850	40°.2	102″.5	O. Arg. S
1894.3	42.3	105.13	A. G. Wash

5500. OΣ 223 *rej.* (7.3...12.0)

R. A. $10^h\ 31^m\ 10^s$ Decl. + 41° 4′

1907.022	136°.0	21″.91
.102	135.6	21.86
.137	134.3	21.77
1907.09	135.3	21.85

Change from proper motion. From the measures of 1879 and 1907 we have the proper motion of A:

0″.133 in 268°.0

5505. H 5481. (9.6...11.4)

R. A. $10^h\ 31^m\ 54^s$ Decl. + 28° 2′

1907.102	105°.0	21″.20
.137	104.2	21.18
1907.12	104.6	21.19

No early measures.

5515. OΣ 224.

R. A. $10^h\ 33^m\ 25^s$ Decl. + 9° 28′

Vogel's nebula (Dreyer 3332) is about 25′ *nf* OΣ 224. This does not appear to belong to the planetary class, but has a small central condensation, and is therefore capable of accurate comparison with the micrometer.

Nebula and 12 m star

1909.206	143°.4	73″.61
.227	143.5	73.17
1909.22	143.4	73.39

The following is from Δ R. A. and Δ Decl. and not direct measures, and hence no motion is to be inferred.

1887.24	145°.0	70″.8	1n	Eng

5528. Σ 1462. (7.8...9.7)

R. A. $10^h\ 35^m\ 36^s$ Decl. + 51° 26′

A and B

1908.974	175°.4	8″.47
9.109	175.5	8.08
9.112	173.7	8.35
1909.06	174.9	8.30

A and C (10.4)

1908.974	57°.90	193″.97
9.109	57.67	194.91
9.112	57.90	194.25
1909.06	57.82	194.38

There is no sensible motion in AB since Σ. For the distant star we have:

1880.63	57°.71	194″.53	2n	Bl.

The proper motion of A from meridian positions is not likely to be correct.

A. G. Harv. 0″.04 in 360°

5535. 40 *Leonis Min.* β 913. (6.0...13.0)

R. A. $10^h\ 36^m\ 26^s$ Decl. + 26° 57′

1909.206	116°.5	13″.90
.227	116.6	13.91
.299	116.3	13.73
1909.24	116.5	13.85

The proper motion of the large star from meridian positions seems to be too large. The five sets of measures of the small star (1880-1909) give:

0″.105 in 262°.0

This will be confirmed in the future by further measures of C and D.

Other determinations from the catalogues are:

Auwers	0″.137	in	248°.1
Porter	0.131	in	246.2
Paris	0.136	in	250.7
Boss	0.124	in	238.4

5543. H 2542. (9.5...10.6)

R. A. $10^h\ 37^m\ 30^s$ Decl. + 74° 3′

1910.109	227°.1	21″.79
.128	228.0	22.22
1910.12	227.5	22.00

No other measures. About 35′ *s* of H 2542 is *h* 738, which is double, or has a double nucleus; the smaller from the other 247°.8: 15″.5. For this Engelhardt gives 253°.6: 13″.5 (1888.38). The brighter of the two may be a small star.

h 738 and star 10.4 m

1910.109	277°.75	104″.2
.128	277.20	103.4
1910.12	277.5	103.8

The star is measured from the bright nucleus. It is probable that the center of the nebula was used by the earlier observers.

1880.05	278°.6	91″.4	1n	Wn
1888.38	278.5	96.4	1n	Eng.

5356. Σ 1415. (6.1...7.0)

R. A. $10^h\ 8^m\ 11^s$ Decl. + 71° 40′

A and C (10.0)

1909.148	10°.23	150″.00
.170	10.10	149.65
.186	10.89	149.49
1909.17	10.41	149.71

I do not find any proper motion given A from meridian observations. The only direct measures are:

1879.55	9°.64	148″.57	2n	Bl.

Further measures should be made.

5376. H 3324. (9.4...9.9)

R. A. $10^h\ 11^m\ 19^s$ Decl. + 68° 44′

1907.140	199°.5	18″.58
.197	199.0	18.62
1907.17	199.2	18.60

Probably unchanged.

5418. β 1322. (7.0...13.3)

R. A. $10^h\ 18^m\ 1^s$ Decl. + 2° 59′

A and C (7.0)

1911.107	64°.00	208″.50
.142	64.12	209.29
.181	64.28	209.01
.184	64.23	209.23
1911.15	64.16	209.01

No suitable third star to connect with either. From a comparison of the A. G. and β positions of AC, one of these stars has a proper motion of 0″.106 in 80°.5 (± 180°)

5430. Σ 1433 *rej.* (8.6...10.4)

R. A. $10^h\ 20^m\ 20^s$ Decl. — 3° 26′

1907.137	262°.5	23″.59
.197	262.2	23.28
.258	262.2	22.77
1907.20	262.3	23.21

No other measures.

5436. 45 *Leonis.* H 832. (6.2...12.1)

R. A. $10^h\ 21^m\ 18^s$ Decl. + 10° 23′

1911.107	131°.10	37″.84
.142	131.55	38.75
.162	131.80	38.52
1911.14	131.48	38.37

Further measures needed for the proper motion of A.

Auwers	0″.022	in	312°.7
Boss	0.014	in	120.7

5441. Σ 1438 *rej.* (9.0...11.0)

R. A. $10^h\ 22^m\ 7^s$ Decl. + 13° 47′

1910.186	248°.1	15″.17
.203	247.4	15.06
.206	248.0	14.80
1910.20	247.8	15.01

The DM number in Part I of the *General Catalogue* should be 2265 instead of 2261. No early measures.

5451. Σ 1440. (8.0...9.5)

R. A. $10^h\ 23^m\ 45^s$ Decl. — 3° 18′

1909.206	347°.2	15″.20
.227	347.1	15.27
.244	347.0	15.20
1909.23	347.1	15.22

No other recent measures.

5466. H 2534. (5.7...12.3)

R. A. $10^h\ 26^m\ 14^s$ Decl. + 41° 2′

1910.206	322°.7	22″.81
.222	322.9	22.53
.225	324.1	22.61
1910.22	323.2	22.65

The measures, 1879-1910, should give a very accurate value of the proper motion of the principal star:

0″.117 in 261°.6

Other values are:

Groombridge	0″.158	in	272°.5
Boss	0.142	in	267.2
Bossert	0.113	in	270.0

5470. Σ 1445. (8.8...11.8)

R. A. $10^h\ 26^m\ 35^s$ Decl. — 0° 15′

1907.137	160°.2	2″.66
.197	158.9	2.70
.258	160.6	2.99
1907.20	159.9	2.78

No material change.

5475. Σ 1444 *rej.* (8.2...10.6)

R. A. $10^h\ 27^m\ 27^s$ Decl. + 64° 13′

1907.140	266°.0	17″.59
10.091	266.2	17.78
10.093	266.5	18.04
1909.11	266.2	17.80

No other measures.

5477. S 610. (8.3...8.5)

R. A. $10^h\ 28^m\ 3^s$ Decl. — 17° 13′

1907.271	43°.5	105″.43
8.192	42.9	105.21
8.214	42.9	105.07
1907.89	43.1	105.24

Change from proper motion. Further measures should be made. The meridian positions give:

1850	40°.2	102″.5	O. Arg. S
1894.3	42.3	105.13	A. G. Wash

5500. OΣ 223 *rej.* (7.3...12.0)

R. A. $10^h\ 31^m\ 10^s$ Decl. + 41° 4′

1907.022	136°.0	21″.91
.102	135.6	21.86
.137	134.3	21.77
1907.09	135.3	21.85

Change from proper motion. From the measures of 1879 and 1907 we have the proper motion of A:

0″.133 in 268°.0

5505. H 5481. (9.6...11.4)

R. A. $10^h\ 31^m\ 54^s$ Decl. + 28° 2′

1907.102	105°.0	21″.20
.137	104.2	21.18
1907.12	104.6	21.19

No early measures.

5515. OΣ 224.

R. A. $10^h\ 33^m\ 25^s$ Decl. + 9° 28′

Vogel's nebula (Dreyer 3332) is about 25′ *nf* OΣ 224. This does not appear to belong to the planetary class, but has a small central condensation, and is therefore capable of accurate comparison with the micrometer.

Nebula and 12 m star

1909.206	143°.4	73″.61
.227	143.5	73.17
1909.22	143.4	73.39

The following is from Δ R. A. and Δ Decl. and not direct measures, and hence no motion is to be inferred.

1887.24	145°.0	70″.8	1n	Eng

5528. Σ 1462. (7.8...9.7)

R. A. $10^h\ 35^m\ 36^s$ Decl. + 51° 26′

A and B

1908.974	175°.4	8″.47
9.109	175.5	8.08
9.112	173.7	8.35
1909.06	174.9	8.30

A and C (10.4)

1908.974	57°.90	193″.97
9.109	57.67	194.91
9.112	57.90	194.25
1909.06	57.82	194.38

There is no sensible motion in AB since Σ. For the distant star we have:

1880.63	57°.71	194″.53	2n	Bl.

The proper motion of A from meridian positions is not likely to be correct.

A. G. Harv. 0″.04 in 360°

5535. 40 *Leonis Min.* β 913. (6.0...13.0)

R. A. $10^h\ 36^m\ 26^s$ Decl. + 26° 57′

1909.206	116°.5	13″.90
.227	116.6	13.91
.299	116.3	13.73
1909.24	116.5	13.85

The proper motion of the large star from meridian positions seems to be too large. The five sets of measures of the small star (1880-1909) give:

0″.105 in 262°.0

This will be confirmed in the future by further measures of C and D.

Other determinations from the catalogues are:

Auwers	0″.137	in	248°.1
Porter	0.131	in	246.2
Paris	0.136	in	250.7
Boss	0.124	in	238.4

5543. H 2542. (9.5...10.6)

R. A. $10^h\ 37^m\ 30^s$ Decl. + 74° 3′

1910.109	227°.1	21″.79
.128	228.0	22.22
1910.12	227.5	22.00

No other measures. About 35′ *s* of H 2542 is *h* 738, which is double, or has a double nucleus; the smaller from the other 247°.8: 15″.5. For this Engelhardt gives 253°.6: 13″.5 (1888.38). The brighter of the two may be a small star.

h 738 and star 10.4 m

1910.109	277°.75	104″.2
.128	277.20	103.4
1910.12	277.5	103.8

The star is measured from the bright nucleus. It is probable that the center of the nebula was used by the earlier observers.

1880.05	278°.6	91″.4	1n	Wn
1888.38	278.5	96.4	1n	Eng.

5545. Σ 1467. (8.0...10.7)

R. A. $10^h 38^m 13^s$ Decl. + 45° 36′

1907.137	294°.1	3″.84
.197	293.3	3.86
.217	292.3	3.87
1907.18	293.2	3.86

Probably fixed. The proper motion of the principal star (Groombridge 1682) is given:

Greenwich 0″.036 in 291°.2

5551. Σ 1469. (7.0...10.0)

R. A. $10^h 39^m 42^s$ Decl. + 66° 6′

1907.137	324°.1	10″.90
.197	323.1	11.00
.217	321.6	10.83
1907.18	322.9	10.91

Relatively fixed. The principal star is given some proper motion:

Schroeter 0″.104 in 270°

5562. Σ 1473. (8.0...8.9)

R. A. $10^h 41^m 43^s$ Decl. — 14° 59′

A and B

1907.137	10°.4	30″.52
8.022	10.3	30.50
8.102	10.3	30.74
1907.75	10.3	30.59

No measures since 1867. Fixed.

A and C (10.7)

1908.022	326°.7	98″.34
.102	327.0	98.92
.266	325.0	98.74
1908.13	326.2	98.67

I do not find this star in any proper motion lists I have examined. If there is any proper motion, it belongs to both components. The third star has not been measured before.

5563. Σ 1474. (6.9...8.0)

R. A. $10^h 41^m 43^s$ Decl. — 14° 38′

A and B

1907.137	24°.4	69″.21
8.022	24.3	69.10
8.102	24.3	68.84
1907.75	24.3	69.05

A and C (7.7)

1907.137	23°.8	75″.95
8.022	23.9	75.93
8.102	23.8	75.89
1907.75	23.8	75.92

B and C

1907.137	18°.7	6″.48
8.022	19.4	6.54
8.102	18.3	6.63
1907.75	18.8	6.55

The measures of AB by Σ, Δ and β (1831-1907) give for the apparent motion of A:

0″.053 in 341°.1

As there is no material change in BC, the proper motion is undoubtedly in A.

5564. H 2545. (8.6...10.8)

R. A. $10^h 42^m 1^s$ Decl. + 55° 55′

1910.206	113°.2	20″.58
.222	113.2	20.35
.225	113.1	20.63
1910.22	113.2	20.52

Disagrees with the prior measure in distance.

5566. S 615. (9.0...9.0)

R. A. $10^h 42^m 18^s$ Decl. — 14° 1′

1909.206	1°.62	85″.99
.227	1.82	86.29
.263	1.68	86.18
1909.23	1.71	86.15

Motion doubtful.

5574. Σ 1477. (8.3...8.8)

R. A. $10^h 43^m 17^s$ Decl. + 13° 34′

1907.137	275°.7	17″.69
.140	274.8	17.50
.258	275.1	17.45
1907.18	275.2	17.55

No measures since 1866. No change.

5587. H 2547. (9.6...9.9)

R. A. $10^h 47^m 6^s$ Decl. + 14° 4′

1908.997	64°.3	26″.94
9.071	64.3	26.98
9.112	64.6	27.06
1909.06	64.4	26.99

About 2^m directly *p* H 2547 is *h* 774. That has a good central condensation, and this I have compared with a faint star north:

h 774 and star 13.2 m

1909.071	356°.5	82″.72
.112	356.3	81.67
1909.09	356.4	82.20

5589. H 1180. (9.4...10.3)

R. A. $10^h 47^m 12^s$ Decl. $+4° 30'$

1912.255	58°.4	17″.78
.274	58.0	17.73
1912.26	58.2	17.75

No other measures of this pair; disagrees with Herschel's estimated angle.

About 80^s nearly *p* H 1180 is *h* 784; in the field with the 8.5 m star DM (4°) 2390. This is faint, small and rather indefinite for measures.

DM (4°) 2390 and *h* 784

1912.255	289°.6	281″.2

5593. b^2 *Hydrae.* (5.4...9.0)

R. A. $10^h 47^m 37^s$ Decl. — 19° 29′

A and B

1908.192	210°.21	132″.05
.214	210.30	131.82
.266	210.18	131.62
1908.22	210.23	131.83

The four sets of measures by Eng and β (1886-1908) give for the proper motion of the large star:

0″.271 in 156°.0

Some of the values from transit observations are:

Auwers	0″.223	in	166°.0
Stumpe	0.315	in	144.9
Porter	0.237	in	165.9
Boss	0.253	in	162.1

5597. Σ 1486. (7.5...8.8)

R. A. $10^h 47^m 52^s$ Decl. $+52° 46'$

1910.206	101°.3	29″.98
.222	101.5	29.78
.225	101.9	29.68
1910.22	101.6	29.81

Distance increasing.

5602. Σ 1480 *rej.* (8.7...10.8)

R. A. $10^h 48^m 41^s$ Decl. $+82° 51'$

1910.109	334°.0	24″.89
.128	334.1	24.53
.148	333.6	24.46
1910.13	333.9	24.63

This has never been measured before. As suggested in the *General Catalogue,* it is DM (82°) 321. From the Carrington positions the Greenwich observers give this star a very small proper motion:

0″.021 in 41°.2

5607. Σ 1488 *rej.* (7.7...10.8)

R. A. $10^h 49^m 39^s$ Decl. $+52° 49'$

1907.102	214°.4	20″.13
.137	213.6	20.13
1907.12	214.0	20.13
1910.184	214°.6	20″.03
.206	214.1	19.89
.222	212.9	20.10
1910.20	213.9	20.01

No other measures. The proper motion of A is given:

A. G. Harv. 0″.058 in 301°.0

5623. Σ 1494. (8.3...10.0)

R. A. $10^h 51^m 45^s$ Decl. $+37° 40'$

A and B

1910.263	330°.0	10″.15
.280	330.6	10.43
.931	331.6	10.17
1910.49	330.7	10.25

The proper motion of the principal star is given:

Ristenpart 0″.181 in 260″.5

As the companion seems to be moving with the other, I have connected a third star:

A and C (11.8)

1910.263	73°.76	135″.22
.280	73.92	135.22
.931	73.65	135.68
1910.49	73.78	135.37

5625. Σ 1497 *rej.* (9.4...9.7)

R. A. $10^h 52^m 22^s$ Decl. $+9° 46'$

1907.137	71°.1	16″.73
.140	71.3	16.82
.258	71.0	16.76
1907.18	71.1	16.77

No early measures.

5640. R *Crateris.* H 1181. (8.3...9.2)

R. A. $10^h 54^m 40^s$ Decl. — 17° 41′

1907.271	268°.2	65″.24
8.192	268.2	65.36
8.214	268.1	65.18
1907.89	268.2	65.26

No other measures since 1866.

A is reddish only. If the proper motion of the principal star is correct, the two are moving together, since there has been no change in the distance in 40 years.

A. G. Wash. 0″.114 in 270°.0

5641. Weisse 26. (8.8...9.0)

R. A. $10^h 54^m 48^s$ Decl. + 21° 44′

1907.140	173°.8	14″.36
.197	174.2	14.28
.217	173.8	14.29
1907.18	173.9	14.31

No other measures.

5653. H 173. (7.1...13.6)

R. A. $10^h 56^m 31^s$ Decl. — 2° 53′

1907.137	177°.8	36″.42
.197	176.8	36.78
1907.17	177.3	36.60

No other measures.

5662. Σ 1505. (8.0...9.7)

R. A. $10^h 58^m 15^s$ Decl. + 63° 16′

A and B

1910.093	312°.1	8″.07
.107	312.7	7.99
.109	312.0	8.61
1910.10	312.3	8.22

No change.

A and C (11.3)

1910.093	175°.52	218″.27
.107	175.75	217.58
.109	175.45	217.94
1910.10	175.57	217.93

No sensible proper motion in A.

1880.64	174°.70	218″.32	2n	Bl.

5675. H 1185. (12.0...12.2)

R. A. $11^h 0^m 47^s$ Decl. + 29° 10′

A and B

1910.260	18°.5	17″.27

The following connects it with the nebula referred to by Herschel:

H 1185 (A) and *h* 820

1910.260	32°.2	259″.4

h 820 is very faint, and the bisection not very certain.

5685. H 4410. (7.5...13.0)

R. A. $11^h 2^m 19^s$ Decl. — 15° 19′

1910.164	226°.4	19″.87
.206	225.0	19.48
.244	223.0	19.69
1910.20	224.8	19.68

These measures seem to confirm the motion in angle.

5688. H 2560. (9.2...11.7)

R. A. $11^h 3^m 11^s$ Decl. + 56° 21′

1908.159	128°.6	32″.38
9.206	128.0	31.70
9.227	129.3	31.98
1908.86	128.6	32.02

No other measures. About 50′ *sf* H 2560 is *h* 838 with a central 14 m star which has been used in comparing with a brighter star *f*.

h 838 and 11 m star

1909.206	24°.4	157″.97
.227	24.6	158.60
1909.22	24.5	158.28

My former measures will be found in Pub. Lick Obsy. II, p. 163.

5695. OΣ 231 *rej.* (7.7...8.7)

R. A. $11^h 4^m 30^s$ Decl. + 31° 6′

A and C (8.0)

1907.997	336°.47	162″.77
8.057	336.35	162.82
8.102	336.53	163.13
8.118	336.62	163.11
1908.07	336.49	162.96

Rejecting my single measure in 1904, the four mean results by OΣ, HΣ, Eng and β (1881-1908) give for the apparent proper motion of A:

0″.641 in 106°.3

It would be unsafe to assume that a star of the magnitude of C has no proper motion, though the chances are that will prove to be the case. I have measured the nearest faint star for the settlement of this matter hereafter.

C and *c* (12.7)

1908.159	34°.82	134″.50
.249	34.85	134.36
1908.20	34.83	134.43

Other values of the proper motion of A are:

Stumpe	0″.557	in	111°.2
Paris	0.605	in	110.8
Porter	0.546	in	110.2

5699. OΣ (App.) 108. (6.2...7.0)

R. A. $11^h 6^m 2^s$ Decl. + 36° 28′

1910.128	70°.70	134″.98
.148	70.45	135.29
.167	70.53	135.63
.184	70.57	135.46
1910.16	70.56	135.34

Assuming that B has no sensible motion, the four positions by Δ, Fr and β (1876-1910) give for the proper motion of A:

0″.227 in 230°.2

To determine this hereafter, I have connected a faint star:

A and C (12.2)

1910.184	160°.04	87″.82
.186	160.66	88.03
.225	160.53	88.89
1910.20	160.41	88.25

B and DM (36°) 2170 (8.0)

1825	Δ R. A. 2^m $52^s.4$	Δ Decl. 57″.2	Weisse
1875	2 53.2	59.2	A. G. Lund
1910.2	2 53.3	60.4	β

5707. Σ 1517. (7.3...7.3)

R. A. 11^h 7^m 24^s Decl. + 20° 47′

AB and C (10.4)

1910.091	101°.93	211″.28
.093	102.10	211.25
.107	102.05	211.53
1910.10	102.03	211.35

The prior positions by OΣ depend upon a single night each. From a comparison with the present measures we have an independent value of the proper motion of AB:

0″.401 in 251°.1

The later determinations from meridian observations are:

A. G. Ber.	0″.417	in	252°.3
Porter	0.425	in	251.8

5708. Arg. 24. (9.0...9.2)

R. A. 11^h 7^m 36^s Decl. — 15° 19′

1910.164	351°.2	17″.60
.206	350.1	17.91
.244	351.2	17.51
1910.20	350.8	17.67

h 837, which should be about 15′ distant and nearly *p* Arg. 24, was not found; doubtful in Dreyer.

5709. δ *Leonis.* β 1282. (2.5...9.1)

R. A. 11^h 7^m 43^s Decl. + 21° 11′

A and BC

1907.102	344°.4	188″.58
.120	344.1	188.63
.173	344.4	188.79
1907.13	344.3	188.67
1911.260	344°.30	189″.44
.315	344.05	189.24
1911.29	344.17	189.34

A and *a* (12.5)

1911.222	40°.93	95″.17
.260	40.90	95.67
1911.24	40.91	95.42

An earlier measure of this star, not given in the *General Catalogue*, is:

1879.26 44°.35 95″.38 2n β^2.

From the two positions of A*a* (1879-1911) and the seven of A and BC (1850-1911) we have for the proper motion of δ *Leonis:*

A and *a*	R. A. + 0″.140	Decl. — 0″.130
A and BC	+ 0.145	— 0.119

Therefore the motion of the large star is:

Measures 0″.189 in 131°.2

From the star catalogues we have:

Auwers	0.181	in	131.5
Newcomb	0.206	in	133.0
Boss	0.207	in	134.4

5721. OΣ (App.) 109. (7.4...8.0)

R. A. 11^h 9^m 1^s Decl. + 46° 31′

1910.128	257°.40	80″.25
.148	257.38	80.11
.167	257.53	80.20
1910.15	257.44	80.19

Change in distance. One of these stars has a proper motion of about 0″.038 along the line joining the components.

5727. H 2564. (9.3...10.9)

R. A. 11^h 10^m 3^s Decl. + 42° 55′

No micrometer measures of this pair, but from the proved accuracy of the astrographic positions at Helsingfors, the following is sufficient at this time:

1895.32 127°.9 32″.33 Donner.

5729. φ *Leonis.* Sh 121. (4.6...8.5)

R. A. 11^h 10^m 34^s Decl. — 3° 0′

1907.997	288°.48	97″.86
8.000	288.65	98.26
8.022	288.95	98.44
8.039	288.33	98.34
1908.01	288.60	98.23

In computing the proper motion, the measures by H and Sh cannot be used for obvious reasons. The four positions by Eng and β (1881-1908) give for the apparent motion of the large star:

0″.123 in 271°.7

The micrometer measures, with the relation of these stars in Weisse, give a larger value:

0″.147 in 275°.6

Other values of the motion of A are:

Newcomb (Stand.)	0″.120	in	246°.0
Newcomb (Fund.)	0.114	in	251.2
Auwers	0.126	in	259.1
Boss	0.121	in	248.6

5732. β 600. (6.5...12.0)

R. A. $11^h\ 10^m\ 53^s$ Decl. — 6° 29′

A and C (8.5)

1910.148	97°.78	59″.16
.167	97.50	59.08
.184	98.10	59.69
1910.17	97.79	59.31

One of these stars has a small proper motion.

5733. OΣ 233. (6.9...9.8)

R. A. $11^h\ 11^m\ 26^s$ Decl. + 67° 20′

A and C (12.0)

1912.066	303°.33	41″.54
.162	303.47	41.83
.164	303.37	41.66
1912.13	303.39	41.68

For the proper motion of the principal star; no other measures.

Schroeter	0″.095	in	253°.4

5735. ν *Ursae.* Σ 1524. (3.7...10.1)

R. A. $11^h\ 12^m\ 0^s$ Decl. + 33° 45′

A and C (13.6)

1911.947	146°.83	154″.98
12.046	145.30	153.96
12.066	146.33	154.82
1912.02	146.15	154.59

The proper motion of A is given from meridian observations:

Auwers (F. C.)	0″.052	in	6°.8
Auwers (cor'd.)	0.050	in	315.9
Newcomb (F. C.)	0.034	in	319.6
Boss	0.027	in	303.7

No sensible change in AB since 1830. No other measures of C.

5746. Σ 1528 *rej.* (8.2...11.8)

R. A. $11^h\ 13^m\ 22^s$ Decl. + 10° 36′

1912.236	218°.1	19″.38
.274	217.7	19.33
.312	217.9	19.28
1912.27	217.9	19.33

The only earlier measure is of recent date.

5768. Wilson 9.

R. A. $11^h\ 18^m$ ± Decl.— 9° 50′±

I failed to find this in or near the rough place given by Wilson. It should be 4′ *s* of β 26.

About 3^m *p* β 26, and in the field with a 6.3 m star, Lalande 21618, are two small nebulae, the nearest a little the brightest, with some central condensation in the other.

L 21618 and *h* 862

1910.128	295°.70	110″.57
.164	295.83	110.48
1910.15	295.76	110.52

L 21618 and *h* 863

1910.128	40°.20	176″.89
.164	40.20	176.12
1910.15	40.20	176.50

Observed by Engelhardt:

1893.22	296°.1	106″.1	1n	Eng
1893.22	40.5	177.9	1n	Eng.

5775. 81 *Leonis.* H 4433. (6.0...10.2)

R. A. $11^h\ 19^m\ 21^s$ Decl. + 17° 8′

1907.006	348°.8	56″.13
.120	347.7	55.95
.140	349.0	56.06
1907.09	348.5	56.05

Change from proper motion of A.

From the measures of the small star (1840-1907) the proper motion of 81 *Leonis* is:

0″.142 in 268°.8

From the star catalogues:

Auwers	0″.172	in	269°.0
Boss	0.144	in	279.2

5789. H 499. (8.5...10.4)

R. A. $11^h\ 21^m\ 44^s$ Decl. + 36° 58′

1908.192	253°.2	40″.57
9.164	253.8	40.27
9.206	253.8	40.21
1908.85	253.6	40.35

No other measures.

5790. τ *Leonis.* Σ 19, App. I. (5.0...7.0)

R. A. $11^h\ 21^m\ 46^s$ Decl. + 3° 31′

A and B

1910.280	174°.82	92″.08
.299	175.02	91.86
.318	174.56	91.63
.320	174.29	91.90
1910.30	174.67	91.87

Assuming no motion in B, the measures of En, Δ and β (1863-1910) give for the apparent motion of A:

0″.109 in 104°.0

This motion from meridian positions seems to be very uncertain:

Auwers	0″.016	in	248°.1
Boss	0.027	in	134.3
Newcomb	0.021	in	142.6

For determining hereafter the motion of B, if any, I have connected a faint star:

B and C (13.3)

1910.280	233°.13	106″.46
.318	234.13	105.98
.337	233.33	106.94
1910.31	233.53	106.46

There is a 14 m star 10″ or 15″ from C.

A and DM (3°) 2507 (9.3)

1875	Δ R. A. + 51s.16	Δ Decl. — 28″.2	A. G. Alb.
1910.3	50.94	30.1	β

B and DM (3°) 2507

1875	Δ R. A. + 50s.26	Δ Decl. + 63″.8	A. G. Alb.
1910.3	50.27	61.6	β

5793. 57 *Ursae Maj.* Σ 1543. (5.2...8.2)

R. A. $11^h 22^m 37^s$ Decl. + 40° 0′

A and C (11.5)

1909.936	9°.00	216″.25
10.091	9.10	216.76
10.093	9.00	216.65
1910.04	9.03	216.55

The proper motion of AB is evidently very small:

1879.62	8°.61	216″.51	2n	Bl.

The 8 m star, DM (40°) 2432, 400″ distant from 57 *Ursae Maj.* in the direction of 236°, has two small stars near for which we have positions in the *Astrographic Catalogue.*

DM (40°) 2432 and star 10.3 m

1909.936	183°.79	97″.94
10.091	184.05	97.85
10.093	184.03	98.06
1910.04	183.96	97.95

DM (40°) 2432 and star 10.4 m

1909.936	167°.79	128″.85
10.091	167.82	128.24
10.093	167.72	128.52
1910.04	167.78	128.54

The other positions are:

1895.31	184°.1	98″.43	Donner
1895.31	167.8	128.59	Donner.

Meridian values of the proper motion of 57 *Ursae* are:

Boss	0″.051	in	280°.1
Auwers	0.079	in	286.9

5801. OΣ (App.) 111. (7.0...9.0)

R. A. $11^h 23^m 44^s$ Decl. + 30° 38′

1909.206	33°.29	66″.98
.227	33.16	67.24
.244	33.48	67.03
1909.23	33.31	67.08

Without change. No third star available for investigating the proper motion of A.

Porter 0″.229 in 200°.5

5809. H 500. (9.5...9.7)

R. A. $11^h 25^m 25^s$ Decl. + 36° 32′

1909.206	27°.8	25″.13
.227	27.9	25.04
1909.22	27.8	25.08

Probably fixed.

5814. H 2574. (9.5...9.5)

R. A. $11^h 25^m 55^s$ Decl. + 53° 41′

A and B

1909.112	77°.9	36″.67
.186	78.2	36.78
1909.15	78.0	36.72

No early measures. The nebula referred to by Herschel is very diffused.

H 2574 (B) and *h* 908

1909.112	15°.0	129″.33
.186	15.4	129.43
1909.15	15.2	129.38

5833. 90 *Leonis.* Σ 1552. (6.0...7.3)

R. A. $11^h 28^m 28^s$ Decl. + 17° 28′

A and C (8.9)

1909.071	234°.88	62″.56
.112	234.77	62.84
.148	234.67	63.02
1909.11	234.77	62.81

Change uncertain. *h* 924 is $2\frac{1}{2}^m$ *f* and 5′ *s;* faint and diffused. The proper motion of 90 *Leonis,* if any, is small:

Auwers	0″.033	in	282°.0
Boss	0.011	in	248.2

5853. H 183. (8...13.5)

R. A. $11^h 31^m 48^s$ Decl. + 13° 37′

1907.006	10°.7	95″.03
.120	10.7	95.16
1907.06	10.7	95.09

Only a little yellowish. No other measures.

5973. Σ 3076. (9.3...9.8)

R. A. 11^h 50^m 30^s Decl. — 4° 33′

1907.258	53°.8	5″.58
7.271	53.8	5.74
8.192	55.1	5.75
1907.57	54.2	5.69

No other measures since 1867. Fixed.

5974. β 918.

R. A. 11^h 51^m 37^s Decl. + 32° 57′

The place given in the *General Catalogue* is that of the 8 m star Lalande 22496 which is 1^m *p*. The correct place of β 918, DM (33°) 2174 is given above.

Three nebulae by d'Arrest precede the double. One of them, Dreyer 3995, is 31^s.9 *p* and 8″.9 *n*. *h* 1027 is about 20′ distant *np;* too faint and diffused for accurate comparison. There is a 6″ pair of small stars in 248°.7 : 48″.9.

6026. OΣ 244.

R. A. 11^h 59^m 29^s Decl. + 53° 33′

h 1085 is about 15′ *sf* OΣ 244.

h 1085 is about 15′ *sf* OΣ 244.

1910.091	260°.4	48″.23
.093	258.0	48.13
.107	259.7	47.93
1910.10	259.4	48.10

h 1085 and star 11.8 m

1910.091	77°.8	122″.71
.093	77.4	124.20
.107	77.4	123.31
1910.10	77.5	123.41

The prior positions give:

1891.49	259°.5	51″.2	1n	Eng
1891.49	77.8	121.1	1n	Eng.

6027. Σ 1599. (7.0...10.0)

R. A. 11^h 59^m 30^s Decl. + 69° 27′

A and C (12.0)

1911.200	331°.88	106″.27
.219	331.85	105.58
.222	331.67	105.58
1911.21	331.80	105.81

A and DM (69°) 641 (7.5)

1911.200	179°.95	126″.79
.219	179.75	126.98
.222	179.77	126.79
1911.21	179.82	126.85

A and DM (69°) 643 (9.1)

1911.219	87°.18	126″.04
.222	87.33	126.21
1911.22	87.25	126.12

From meridian observations of the two larger stars:

1875	179°.2	129″.7	A. G. Chris.
1900	179.6	126.9	Greenwich
1875	88.0	127.0	A. G. Chris.
1900	87.3	127.3	Greenwich.

6035. Σ 1602. (7.5...9.0)

R. A. 12^h 1^m 7^s Decl. + 69° 45′

A and B

1911.219	179°.2	16″.51
.222	179.1	16.43
.260	179.4	16.34
1911.23	179.2	16.43

From the measures of Σ, Δ, HΣ and β (1831-1911) the proper motion of A is:

0″.044 in 356°.5

It is not probable that B has any sensible movement which would change this result, but I have connected a distant faint star:

A and C (11.2)

1911.219	317°.18	155″.16
.222	317.13	154.88
.260	316.80	155.46
1911.23	317.04	155.17

6036. H 2596.

R. A. 12^h 1^m 15^s Decl. + 43° 46′

H 2596 (A) and *h* 1088

1911.219	239°.3	224″.7
.222	239.3	225.0
1911.22	239.3	224.8

h 1088 is brighter in the middle, and elongated in 133°.

H 2596 (A) and *h* 1091

1911.22 Δ R. A. 25^s.5 Δ Decl. 102″.6

h 1091 is small, round and diffused. This is the one referred to by Herschel.

6045. Σ 3078. (8.2...11.0)

R. A. 12^h 3^m 10^s Decl. + 11° 58′

1911.142	306°.4	9″.64
.164	306.8	9.67
1911.15	306.6	9.65

No change since 1830.

6050. Σ 1605. (8.0...8.5)

R. A. $12^h\,4^m\,19^s$ Decl. — 1° 34′

1909.266	278°.8	23″.63
.302	278.8	23.77
.304	278.8	23.82
1909.29	278.8	23.74

Without change.

6052. Σ 3079. (8.7...10.7)

R. A. $12^h\,4^m\,32^s$ Decl. — 4° 5′

1910.186	87°.76	14″.92
.206	87.23	14.79
.244	86.88	14.98
1910.21	87.29	14.90

In the *General Catalogue* this is called SD (4°) 3246; it should be (3°) 3246. No change since 1868.

6064. Σ 1608. (7.5...7.7)

R. A. $12^h\,5^m\,31^s$ Decl. + 54° 6′

1909.263	223°.2	11″.79
.299	222.6	11.89
.304	223.0	12.13
1909.29	222.9	11.94

No third star near enough. Distance increasing.

Bossert	0″.17	in	180°

6067. Sh 136. (6.0...8.0)

R. A. $12^h\,5^m\,36^s$ Decl. + 82° 23′

1911.162	75°.39	66″.81
.181	75.26	66.46
.184	75.45	66.77
.200	75.23	66.95
1911.18	75.33	66.75

The proper motion of the principal star is extremely uncertain in direction and amount.

Groombridge	0″.012	in	345°.9
Greenwich (1890)	0.045	in	304.0
Greenwich (1900)	0.016	in	296.5
Boss	0.019	in	267.0

The relative motion of A with respect to B from the measures (1876-1911) is:

0″.049 in 244°.1

6068. Σ 1609. (7.7...9.5)

R. A. $12^h\,5^m\,41^s$ Decl. + 51° 30′

A and C (12.6)

1911.219	146°.30	68″.53
.222	145.70	68.53
.260	146.05	68.64
1911.23	146.02	68.57

The alleged proper motion of A needs confirmation.

A. G. Harv.	0″.140	in	270°.0

No change in AB. No other measures of C.

6083. *Virginis* 78. H 203. (6.8...12.7)

R. A. $12^h\,8^m\,6^s$ Decl. — 5° 3′

A and B

1909.112	353°.1	24″.88
.186	351.4	25.09
.227	352.6	25.30
1909.17	352.4	25.09

Rejecting the single measure of 1878, the other positions give for the proper motion of A:

Measures	0″.151	in	328°.3
Porter	0.184	in	317.7

Further measures should be made for a final correction to the proper motion. In this interest, I have added a third 11 m star.

A and C

1909.112	194°.83	74″.16
.186	195.18	74.55
.227	195.05	74.54
1909.17	195.02	74.42

6084. Σ 1616. (7.5...9.7)

R. A. $12^h\,8^m\,19^s$ Decl. + 9° 27′

A and C (9.5)

1909.112	293°.10	154″.91
.148	293.00	155.11
.151	293.00	154.36
1909.14	293.03	154.79

These measures should be repeated at a later date for the true proper motion of A, as the first position by Dembowski depends upon a single night. The three measures (1864-1909) give:

0″.147 in 147°.4

Other values from transit observations are:

Porter	0″.140	in	161°.5
Paris	0.171	in	180.0

A and DM (9°) 2600 (9.0)

1884.1	Δ Decl. 139″.9	A. G. Leip.
1901.1	136.7	β

6090. Σ 1619. (7.5...7.8)

R. A. $12^h\ 8^m\ 59^s$ Decl. — 6° 35′

A and B

1910.318	280°.5	7″.42
.320	278.7	7.21
.337	279.9	7.23
1910.32	279.7	7.29

Another value of the proper motion of AB is:

Porter 0″.248 in 266°.7

For an independent determination of this motion, I have connected the 9.5 m star, SD (6°) 3533:

A and C

1910.299	177°.65	98″.98
.318	177.40	99.32
.320	177.27	99.35
1910.31	177.44	99.22

6124. H 2609.

R. A. $12^h\ 12^m\ 18^s$ Decl. + 5° 55′

The R. A. in the *General Catalogue* is 1^m too large. The object referred to by Herschel is *h* 1178.

H 2609 and *h* 1178

1910.10	Δ R. A. — 38^s.5	Δ Decl. — 42″.35

6128. Σ 1631 *rej.* (8.3...10.8)

R. A. $12^h\ 13^m\ 58^s$ Decl. — 13° 27′

1909.304	278°.7	15″.73
.342	278.2	15.73
.378	278.1	15.42
1909.34	278.3	15.63

No other measures.

6132. H 207. (10.5...10.6)

R. A. $12^h\ 14^m\ 35^s$ Decl. + 15° 8′

1909.186	100°.8	23″.27
.227	100.9	23.72
1909.21	100.8	23.50

No other measures. About 15′ *nf* H 207 are *h* 1198 and *h* 1199; too diffused for accurate measures.

6133. 11 *Comae.* Ho 52. (5.0...13.0)

R. A. $12^h\ 14^m\ 39^s$ Decl. + 18° 27′

1910.148	44°.1	9″.28
.244	43.9	9.35
.280	43.4	9.51
1910.22	43.8	9.38

Some relative change, and perhaps a system of the 61 *Cygni* type. No third star available.

The proper motion of 11 *Comae* is given:

Auwers	0″.166	in	302°.8
Bossert	0.145	in	308.3
Boss	0.139	in	304.1

6144. H 518.

R. A. $12^h\ 15^m\ 56^s$ Decl. + 29° 49′

The absence of any description in Herschel makes the identification somewhat uncertain, but it is probably the pair measured:

A and B (10.7...11.5)

1909.304	323°.6	22″.88

H 518 and *h* 1205

1909.304	357°.2	213″.0

No other measures. *h* 1206 is in the same vicinity.

6145. OΣ 247 *rej.* (7.0...13.5)

R. A. $12^h\ 16^m\ 11^s$ Decl. + 3° 58′

1909.266	340°.9	11″.85
.304	342.7	11.77
.342	340.8	11.77
1909.30	341.5	11.80

The apparent change, in both distance and angle since 1899, indicates some proper motion in A.

6147. 17 *Virginis.* Σ 1636. (6.2...9.0)

R. A. $12^h\ 16^m\ 26^s$ Decl. + 5° 58′

1910.091	336°.58	20″.36
.107	336.68	20.16
1910.10	336.63	20.26

No material change. The proper motion of 17 *Virginis* is:

Auwers	0″.195	in	254°.0
Bossert	0.189	in	251.4
Glasgow	0.203	in	233.3
Boss	0.180	in	250.6

About 15′ *sf* 17 *Virginis* is a small, round nebula, discovered by d'Arrest.

Dreyer 4324 and star 10.7 m

1910.091	65°.2	226″.86
.107	65.8	226.04
1910.10	65.5	226.45

6154. H 209. (9.3...9.6)

R. A. $12^h 17^m 46^s$ Decl. — 2° 23′

1910.128	148°.3	23″.85
.148	146.6	23.84
.164	146.8	23.81
1910.15	147.2	23.83

Change in distance? In the recent measures by Zinner this pair is erroneously called A 79, another pair 3^m *f* and ½° *s*.

6156. OΣ 248 *rej.*

R. A. $12^h 18^m 4^s$ Decl. + 6° 38′

Three nebulae, *h* 1213, *h* 1215 and *h* 1222 precede the OΣ star, the nearest about 50^s *p* and 4′ *n*.

h 1215 and star 10.3 m

1911.219	73°.6	204″.9

h 1222 and same star

1911.164	174°.6	90″.6
.219	174.3	91.4
1911.19	174.4	91.0

For the last there is an earlier position:

1893.27 174°.6 91″.3 Kobold

6181. OΣ 251.

R. A. $12^h 23^m 9^s$ Decl. + 32° 3′

No apparent elongation. About 30′ distant *sp* is *h* 1258. This in the DM is (32°) 2246 (9.5). No comparison star near.

6183. δ *Corvi.* Sh 145. (3.0...8.7)

R. A. $12^h 23^m 40^s$ Decl. — 15° 51′

1910.318	214°.8	24″.06
.337	214.4	24.23
.340	215.0	24.15
1910.33	214.7	24.15

No third star near; common proper motion.

A and SD (15°) 3485

1900	Δ R. A. $67^s.6$	Δ Decl. 113″.8	A. G. Wash.
1910.34	67.6	115.8	β

The proper motion of δ *Corvi* is given:

Auwers	0″.261	in	240°.1
Bossert	0.251	in	233.4
Boss	0.252	in	235.5
Newcomb	0.251	in	233.7

6192. Sh 146.

R. A. $12^h 25^m 7^s$ Decl. + 1° 59′

A and C (7.2...8.0)

1912.351	290°.03	49″.56
.353	289.68	49.51
.389	289.62	49.63
1912.36	289.78	49.57

There is no evidence of relative motion since the measures of OΣ in 1860.

There is a new companion to the principal star, not heretofore seen:

A and B (12.3)

1912.351	334°.6	4″.65
.353	335.6	4.70
.389	339.4	4.51
1912.36	336.5	4.62

6211. Σ 1658. (8.0...9.8)

R. A. $12^h 29^m 0^s$ Decl. + 8° 7′

A and C (8.2)

1909.071	260°.13	109″.14
.148	260.40	109.08
.186	260.45	109.22
1909.13	260.33	109.15

Comparing this with the OΣ measures, we have for the apparent proper motion of A, assuming C to be fixed:

0″.213 in 117°.4

h 1329 and star 12.3 m

1909.071	185°.3	82″.67
.148	185.7	82.03
1909.11	185.5	82.35

This is 1^m *f* and 13′ *n* of Σ 1658.

6215. Σ 1659. (8.0...8.1)

R. A. $12^h 29^m 32^s$ Decl. — 11° 23′

A and C (11.0)

1908.214	69°.12	36″.61
.252	69.40	36.82
.266	69.30	36.48
1908.24	69.27	36.64

B and C

1908.214	110°.08	41″.07
.252	109.90	41.14
.266	110.20	41.04
1908.24	110.06	41.08

A and F

1908.214	142°.70	200″.21
.252	142.39	200.40
.266	142.53	200.93
1908.24	142.54	200.51

A and E

1908.214	275°.80	168″.80
.252	275.87	169.41
.266	275.83	169.25
1908.24	275.83	169.15

A and D

1908.214	27°.60	184″.76
.252	27.53	184.99
.266	27.68	184.96
1908.24	27.60	184.90

F and E

1908.214	Δ R. A. — 290″.87	Δ Decl. + 177″.13
.252	290.76	177.42
.266	290.78	177.29
1908.24	290.80	177.28

Struve's A, B and C are symmetrically placed in the equilateral triangle of large stars, DEF, the last two being Lalande 23531 and 23545. The only measures are by Dembowski:

AF	1870.99	143°.83	198″.32	3n	Δ
AE	1870.99	276.33	175.51	3n	Δ
AD	1870.99	25.90	184.08	3n	Δ
FE	1870.99	301.62	342.29	3n	Δ
FE	1908.24	301.37	340.58	3n	β

Evidently these large stars have some proper motion as well as AB, the amount of which will more definitely appear hereafter.

E has an exceedingly faint companion:

E and *e* (15.5)

1909.304	233°.6	11″.16

h 1327 is about 2^m directly *p* E, but too diffuse for measurement.

6218. Σ 1662. (7.7...10.0)

R. A. $12^h\ 30^m\ 16^s$ Decl. + 57° 14′

1907.217	234°.0	19″.72
7.271	234.3	19.65
8.039	234.9	19.70
1907.51	234.4	19.69

Perhaps a small advance in the angle.

6225. Σ 1664. (7.7...8.8)

R. A. $12^h\ 32^m\ 7^s$ Decl. — 10° 51′

A and B

1907.006	241°.4	23″.84
.137	241.8	24.03
.214	241.3	24.19
1907.12	241.5	24.02

A and E

1907.006	109°.35	118″.85
.137	109.80	118.74
.214	109.50	118.95
1907.12	109.55	118.85

E and F

1907.006	111°.0	94″.10
.137	110.9	93.35
.214	111.3	93.60
1907.12	111.1	93.68

C and D

1907.214	265°.6	32″.45
.233	265.8	32.63
.258	265.3	32.48
1907.23	265.6	32.52

A and C

1907.137	306°.6	62″.49
.214	306.2	62.48
.233	306.4	62.54
1907.19	306.4	62.50

B and C

1907.214	329°.6	56″.59
.233	329.5	56.77
.258	329.0	56.67
1907.23	329.4	56.68

The meridian positions of the large stars, A, E and F, in Lamont and Weisse show no material relative change, and it is at least probable that the change in AB is due to the proper motion of the smaller component. To determine this hereafter, the small stars, C and D, measured by Doolittle, are connected with the principal components. The only previous measures, of the angles at the Temple Observatory, are too discordant for use in this connection.

The measures of AB by Σ and β (1830-1904) give for the apparent motion of A:

0″.161 in 18°.9

6229. Σ 1665. (8.5...9.0)

R. A. $12^h\ 32^m\ 30^s$ Decl. — 4° 40′

1910.186	99°.8	8″.72
.206	98.3	8.97
.244	99.5	8.90
1910.21	99.2	8.86

No change. *h* 1375 is about 15′ distant, nearly *f*; small and bright in the middle.

h 1375 and star 11.7 m

1910.186	301°.3	181″.75
.206	301.2	181.63
1910.20	301.2	181.69

6230. S 639. (8.0...9.3)

R. A. $12^h\ 32^m\ 33^s$ Decl. — 3° 43′

1911.302	107°.93	52″.37
.356	107.78	52.65
.373	107.98	52.67
1911.34	107.90	52.56

The early distances by H and OΣ, each on a single night, appear to have considerable errors. The four positions (1881-1911) give for the proper motion of A:

0″.049 in 356°.4

When further measures are made after a suitable interval, the single measure of 1881 should be rejected as the distance is doubtless too small.

6237. H 2617. (7.9...10.3)

R. A. 12ʰ 34ᵐ 51ˢ Decl. + 40° 47′

1907.217	3°.8	5″.23
7.271	5.8	5.34
8.039	7.8	5.51
1907.51	5.8	5.36

No early measures.

6239. Σ 1669. (6.5...6.5)

R. A. 12ʰ 35ᵐ 3ˢ Decl. — 12° 21′

A and C (10.3)

1911.302	233°.93	59″.33
.356	233.77	59.39
.373	233.93	59.45
1911.34	233.88	59.39

For the proper motion of AB. C is SD (12°) 3675.

The relative motion in AB is very small, and these stars probably form a system of the 61 *Cygni* class. The proper motions are given by Boss:

A	0″.129	in	269°.6
B	0.117	in	271.0

6242. 27 *Virginis.* H VI. 81. (6.5...9.2)

R. A. 12ʰ 35ᵐ 32ˢ Decl. + 11° 5′

1910.280	281°.80	84″.33
.299	281.92	84.63
.318	281.70	84.30
.320	281.55	84.41
1910.30	281.74	84.42

The two β measures give nearly the same proper motion of A as that in the catalogues, but a longer time interval is necessary for a final correction to the meridian value.

Auwers	0″.155	in	271°.1
Bossert	0.162	in	266.5
Boss	0.114	in	269.0

6259. Σ 1675. (8.3...9.0)

R. A. 12ʰ 38ᵐ 40ˢ Decl. + 35° 4′

1908.192	7°.2	30″.39
8.249	7.3	30.49
9.071	7.0	30.47
1908.50	7.2	30.45

Very little change, if any.

6263. Σ 1678. (6.3...7.0)

R. A. 12ʰ 39ᵐ 26ˢ Decl. + 15° 2′

1912.236	191°.85	32″.68
.255	191.88	32.53
.258	191.50	32.40
1912.25	191.74	32.54

Probably a system of the 61 *Cygni* class. (See *General Catalogue,* Part II.) Unfortunately there is no third star available for measurement. The proper motions of A and B are still uncertain. The latest by Boss is:

A	0″.025	in	38°.3
B	0.020	in	287.8

6267. OΣ 255 *rej.* (7.0...12.0)

R. A. 12ʰ 40ᵐ 8ˢ Decl. + 3° 7′

1907.006	340°.3	18″.75
.120	339.5	19.29
.173	339.6	18.89
1907.10	339.8	18.98

Some change in the angle.

6268. Σ 1679. (8.5...9.0)

R. A. 12ʰ 40ᵐ 28ˢ Decl. + 50° 29′

A and B

1908.060	207°.4	5″.70
.118	207.5	5.60
.192	208.3	5.76
1908.12	207.7	5.69

A and C (12.4)

1908.192	39°.10	69″.89
.249	38.75	69.47
.266	39.02	69.65
1908.24	38.96	69.67

No change in AB. The third star is measured for the first time to determine hereafter the proper motion of A.

A. G. Harv. 0″.083 in 90°

6269. A. G. 181. (9.4...9.6)

R. A. 12ʰ 41ᵐ 28ˢ Decl. + 34° 36′

1908.000	340°.5	1″.93
.079	335.5	1.69
.249	340.3	1.51
1908.11	338.8	1.71

The wrong star was examined in 1904.

No other measures.

6274. S 642. (8.6...8.8)

R. A. $12^h\ 42^m\ 49^s$ Decl. + 14° 42′

1912.162	28°.83	59″.98
.164	28.45	60.10
.236	28.48	60.12
1912.19	28.59	60.07

No third star near for comparison. One of the nearly equal components has a small proper motion. The four positions by β and Doo on 13 n (1879-1912) give for this movement:

0″.086 in 162°.8 (± 180°)

h 1431 is 65^s *p* and 18′ *s;* large and diffused.

6284. Σ 1682. (6.7...9.0)

R. A. $12^h\ 45^m\ 8^s$ Decl. — 9° 41′

A and B

1911.302	304°.0	31″.12
.356	305.0	30.98
.375	303.8	31.22
1911.34	304.3	31.11

The proper motion of A from the measures is:

0″.045 in 351°.7

B and C (11.1)

1911.302	200°.78	143″.68
.356	200.74	143.68
.375	200.95	144.24
1911.34	200.82	143.87

6287. 30 *Comae.* H 522. (6.0...11.7)

R. A. $12^h\ 43^m\ 26^s$ Decl. + 28° 12′

1912.236	12°.98	42″.67
.255	12.73	42.46
.274	13.20	42.31
1912.25	12.97	42.48

The place given in Part I of the *General Catalogue* is that of 31 *Comae,* which is $2^m\ 25^s$ following, same declination. The R. A. should be as given here.

From the four β measures of the small star (1878-1912) the proper motion of 30 *Comae* is:

0″.067 in 295°.8

This has been given from meridian positions:

Auwers	0″.115	in	287°.7
Boss	0.096	in	276.7

6289. Σ 1685. (6.8...7.3)

R. A. $12^h\ 45^m\ 59^s$ Decl. + 19° 49′

A and B

1909.342	201°.1	15″.93
.359	201.6	15.84
.378	201.1	15.75
1909.36	201.3	15.84

The proper motions in A. G. Berlin are:

A	0″.060	in	289°.5
B	0.042	in	270.0

As there has been no change in these stars in more than 80 years, it is evident the motions are exactly the same.

A and C (8.0)

1909.340	325°.70	246″.84
.342	325.53	246.70
.359	325.83	246.63
1909.35	325.69	246.72

C is Lalande 23970. There are no very accurate positions for comparison:

1823.44	329°.4	249″.67	in	Sh
1826	327.6	259.2		Weisse
1870	325.2	248.7		A. G. Ber.

6292. 32 and 33 *Comae.* Σ 23, App. I. (5.3...6.1)

R. A. $12^h\ 46^m\ 14^s$ Decl. + 17° 43′

1910.203	49°.52	194″.78
.206	49.53	195.49
.222	49.80	195.20
.225	49.95	195.11
1910.21	49.70	195.15

A and DM (17°) 2549

1875	Δ R. A. — $62^s.3$	Δ Decl. — 120″.2	A. G. Ber.
1910.19	62.2	120.4	β

The proper motion of AB, if any, is very small.

As there has been no material change in these stars since 1836, whatever proper motion there is, is common to both.

We have from the star catalogues:

A	0″.050	in	270°.0	Auwers
	0.023	in	205.5	Boss
B	0.065	in	138.8	Auwers
	0.049	in	148.5	Boss

6293. H 2621. (8.8...8.8)

R. A. $12^h\ 46^m\ 25^s$ Decl. + 7° 52′

A and B

1907.120	84°.7	34″.84
.137	85.2	34.96
1907.13	85.0	34.90

A and C (10.5)

1907.120	128°.2	38″.05
.137	129.2	38.32
1907.13	128.7	38.18

No other measures.

6302. Σ 1688. (8.5...10.0)

R. A. 12^{h} 47^{m} 53^{s} Decl. + 38° 37′

A and C (12.3)

1912.236	359°.98	76″.95
.255	359.83	77.29
.312	360.06	76.94
1912.27	359.96	77.06

For the supposed proper motion of AB.

6307. Σ 1689. (6.7...9.0)

R. A. 12^{h} 49^{m} 29^{s} Decl. + 12° 9′

1909.340	209°.4	28″.63
.342	209.7	28.49
.359	210.6	28.75
1909.35	209.9	28.62

Change in angle.

6308. δ *Virginis.*

R. A. 12^{h} 49^{m} 34^{s} Decl. + 4° 3′

This star is given in Part I of this work.

6309. Σ 1691. (8.2...9.0)

R. A. 12^{h} 49^{m} 50^{s} Decl. + 58° 49′

1910.206	276°.0	18″.87
.222	275.3	18.43
.225	276.0	18.78
1910.22	275.8	18.69

No measures since 1867.

A and DM (58°) 1403 (9.1)

1910.206	86°.20	131″.08
.222	86.50	130.95
.225	86.48	130.83
1910.22	86.39	130.95

No other measures of this.

6315. Σ 1693. (9.0...9.7)

R. A. 12^{h} 50^{m} 36^{s} Decl. + 7° 40′

1907.006	331°.5	8″.36
.120	331.9	8.89
.137	332.2	8.65
1907.09	331.9	8.63

No sensible motion.

6318. Σ 1695. (6.3...8.2)

R. A. 12^{h} 51^{m} 3^{s} Decl. + 54° 45′

A and C (10.9)

1909.071	141°.43	125″.08
.109	141.40	124.48
.164	141.70	124.37
1909.11	141.51	124.64

For comparison we have:

1880.12	142°.22	123″.60	2n	Bl.

The measures indicate proper motion of A of about 0″.06 in 270°. The observations should be continued after a suitable interval.

The proper motion from the catalogues is:

Auwers	0″.094	in	270°.0
Kustner	0.093	in	266.3
Bossert	0.095	in	270.0
Boss	0.075	in	265.4

6337. 44 *Virginis.* Σ 1704. (6.0...11.2)

R. A. 12^{h} 53^{m} 29^{s} Decl. — 3° 10′

1912.274	53°.5	21″.11
.296	54.0	20.83
.312	53.5	20.70
1912.29	53.7	20.88

There has been no material relative change in 80 years. The proper motion is small, and apparently common to both components.

Auwers	0″.055	in	280°.5
Boss	0.029	in	262.0

6342. 46 *Virginis.* A. G. Clark 5. (5.4...8.2)

R. A. 12^{h} 54^{m} 25^{s} Decl. — 2° 43′

A and C (13)

1912.236	121°.6	35″.77
.296	122.0	36.56
.312	122.3	35.74
1912.28	122.0	36.02

The proper motion is small and not very certain.

Auwers	0″.089	in	316°.2
Boss	0.055	in	326.9

The first measure is on a single night, and therefore entitled to small weight. The three measures taken together show that the proper motion is not less than 0″.10, and that it is nearly all in declination. Further measures will give an exact value.

6359. H 2633. (9.6...9.6)

R. A. 12^{h} 56^{m} 55^{s} Decl. + 74° 21′

1909.263	91°.1	4″.95
.299	91.1	4.91
1909.28	91.1	4.93

No other measures.

6371. Σ 1715. (8.6...9.6)

R. A. 12^h 58^m 9^s Decl. + 20° 2′

1910.184	230°.4	7″.25
.186	229.9	7.22
.203	231.1	7.38
1910.19	230.5	7.28

Probably fixed.

6385. β 1083.

R. A. 13^h 0^m 27^s Decl. + 29° 40′

A and BC (6.0...11.5)

1909.170	216°.1	6″.22
.227	217.4	6.10
.263	218.5	6.04
1909.22	217.3	6.12

A and *h* 1531

1909.227	35°.8	149″.25

h 1531 is small and diffuse, but with some central condensation. No proper motion found for the large star. Not in Boss' *General Catalogue*.

6396. S 647. (7.5...9.3)

R. A. 13^h 2^m 19^s Decl. — 2° 2′

1909.071	213°.27	41″.95
.148	213.48	42.07
.164	213.52	42.00
1909.13	213.42	42.01

Probably fixed.

6405. *θ Virginis.* Σ 1724. (4.0...9.0)

R. A. 13^h 3^m 44^s Decl. — 4° 54′

A and C (9.0)

1910.167	298°.60	71″.25
.203	298.45	71.08
.206	298.43	70.84
1910.19	298.49	71.06

The measures of this star should be continued. The proper motion of *θ Virginis* is given:

Auwers	0″.074	in	240°.1
Newcomb	0.059	in	227.8
Boss	0.057	in	222.8

The Herschel nebula, II. 185, about 40^s *p* and 9′ *n*, has a well-defined nucleus for measurement.

Nebula and star 10.5 m

1910.203	193°.8	163″.25
.244	194.0	163.60
1910.22	193.9	163.42

For comparison we have:

1875.31	192°.8	162″.0	Wn.

6412. OΣ (App.) 121. (6.5...9.7)

R. A. 13^h 5^m 12^s Decl. + 62° 52′

1909.071	8°.95	107″.54
.112	9.28	107.60
.164	9.44	107.83
1909.12	9.22	107.66

If the larger star has any proper motion, the other is moving with it.

Greenwich 0″.028 in 228°.1

6414. 53 *Virginis.* H 2645. (5.2...12.5)

R. A. 13^h 5^m 40^s Decl. — 15° 33′

A and B

1908.156	6°.37	78″.50
9.170	6.62	79.65
9.304	7.00	79.68
1908.88	6.66	79.28

A and C (10)

1908.156	328°.38	234″.80
.192	328.14	235.23
.370	328.35	234.90
1908.24	328.29	234.98

The distant star was at first taken for that measured by Doolittle in 1897. Subsequently that was looked for among the bright stars in this part of *Virgo*, but could not be found.

The measures of B are continued for an independent determination of the proper motion of A. The β measures (1878-1908) give the proper motion of 53 *Virginis:*

0″.304 in 163°.1

Other values of this from meridian positions are:

Auwers	0″.285	in	168°.6
Hedrick	0.302	in	161.5
Boss	0.314	in	163.1

6425. S 648. (8.0...8.0)

R. A. 13^h 7^m 16^s Decl. + 18° 40′

1909.071	66°.7	87″.13
.112	66.6	87.45
.148	66.5	87.72
1909.11	66.6	87.43

The cluster, *h* 1558, is about 10′ *n*. In the *General Catalogue* the Dreyer number should be 5024 instead of 5053. The latter (*h* 1569) is some distance following.

6431. Sh 162. (7.0...8.0)

R. A. 13^h 8^m 39^s Decl. — 10° 43′

A and B

1909.071	50°.60	73″.73
.148	49.80	74.18
.164	50.44	74.14
1909.13	50.28	74.02

The five positions by OΣ, Eng and β (1840-1909) give for the proper motion of A:

0″.371 in 215°.9

But B is not a small star, and might have some movement of its own; I have therefore measured a third faint star.

B and C (12.3)

1909.071	134°.97	69″.10
.148	135.10	68.36
.164	134.97	68.90
1909.13	135.01	68.79

The proper motion of A from meridian observations is:

Porter	0″.388	in	219°.4
Kustner	0.395	in	216.9

6434. Σ 25, App. I. (5.9...6.3)

R. A. $13^h\,9^m\,23^s$ Decl. + 67° 55′

A and C (7.8)

1907.214	229°.6	116″.51
.217	229.4	116.12
.258	229.8	116.21
1907.23	229.6	116.28

A and B (6.3)

1907.217	296°.1	178″.88
.258	296.3	178.83
1907.24	296.2	178.85

The six sets of measures of AC (1835 to 1907) give for the apparent proper motion of A:

0″.169 in 270°.5

C appears to have no motion in space. A and B have shown no relative motion since 1835, and therefore they must have the same proper motion. From the catalogues we have:

A	0″.157	in	274°.4	Schroeter
	0.157	in	271.1	Groombridge
B	0.148	in	270.0	Schroeter
	0.158	in	274.7	Groombridge

6442. β 800. (7.1...10.2)

R. A. $13^h\,10^m\,52^s$ Decl. + 17° 40′

A and B

1907.331	111°.2	2″.95
9.302	110.3	3.33
9.304	111.3	3.18
1908.65	110.9	3.15

A and C (11.0)

1909.302	9°.58	89″.31
.304	9.20	89.69
1909.30	9.39	89.50

The last for the proper motion of AB. No other measures. The motion of the large star is given:

Krueger	0″.697	in	113°.6
Porter	0.675	in	111.9

6452. H 529. (9.3...11.0)

R. A. $13^h\,13^m\,59^s$ Decl. + 35° 47′

These small stars have a large common proper motion:

Porter	0″.900	in	154°.6
Kustner	0.874	in	154.9

The star measured by Ball is now too distant for good measures. I have therefore measured a nearer star in the field.

A and C (11.6)

1909.170	74°.70	152″.50
.263	74.95	152.62
.299	74.78	152.68
1909.24	74.81	152.60

6458. Σ 1735. (9.5...9.5)

R. A. $13^h\,15^m\,44^s$ Decl. + 6° 27′

1907.137	109°.6	3″.95
.258	110.6	4.10
.331	109.8	3.97
1907.24	110.0	4.01

Without change.

6474. Σ 1740. (7.1...7.2)

R. A. $13^h\,17^m\,33^s$ Decl. + 3° 20′

1911.142	75°.3	26″.60
.162	75.7	26.64
.164	76.1	26.54
1911.16	75.7	26.59

No third star near enough to measure.

These stars appear to make a system of the 61 *Cygni* type. The relative change is very slow. The proper motions are given:

A	0″.217	in	6°.0	Porter
	0.201	in	351.9	Glasgow
	0.202	in	359.5	A. G. Alb.
B	0.254	in	360.0	Porter
	0.248	in	323.3	Glasgow

6475. H 226. (11.9...13.1)

R. A. $13^h\,17^m\,36^s$ Decl. + 14° 38′

1909.071	24°.8	9″.47
.302	23.7	9.82
1909.19	24.2	9.65

Very insignificant object; no other measures. *h* 1595 is in a low-power field with H 226.

h 1595 and DM (14°) 2609 (9.3)

1909.071	81°.3	107″.04
.302	81.3	107.09
1909.19	81.3	107.06

6477. Σ 1741. (8.2...9.7)

R. A. 13h 18m 4s Decl. — 1° 29′

1907.137	262°.8	24″.93
.233	262.4	24.92
.258	262.5	24.78
1907.21	262.6	24.88

No change since 1828.

The stars measured by Glasenapp are DM (— 1°) 2814 and 2813:

1907.233	245°.6	64″.66
.258	246.0	64.83
1907.25	245.8	64.74

The only other measures are given in the *General Catalogue.*

6493. Σ 1746. (7.7...10.3)

R. A. 13h 22m 11s Decl. + 10° 5′

1907.137	249°.4	27″.11
.233	249.7	26.87
.271	249.8	27.05
1907.21	249.6	27.01

Change in distance. From the measures the proper motion of the principal star is:

0″.035 in 262°.9

6498. OΣ (App.) 123. (6.4...6.8)

R. A. 13h 23m 2s Decl. + 65° 22′

A and B

1910.280	146°.92	69″.06
.282	146.95	69.01
.299	147.00	68.86
1910.29	146.96	68.98

The proper motions of the large stars (Groombridge 1996 and 1997) are given from meridian positions:

A	0″.117	in	295°.9	Schroeter
	0.071	in	317.5	Groombridge
B	0.098	in	289.1	Schroeter
	0.067	in	320.9	Groombridge

As there is no relative change in these stars, the proper motions, if any, would be exactly the same. To determine this movement later, I have connected a faint star.

B and C (12.4)

1910.280	92°.23	32″.93
.282	91.88	32.93
.299	92.20	32.93
1910.29	92.10	32.93

6501. R *Hydrae.* Ho 381. (Var...11.8)

R. A. 13h 23m 10s Decl. — 22° 39′

1910.244	325°.0	21″.80
.307	324.7	21.31
.375	323.9	21.67
1910.31	324.5	21.59

The proper motion is small:

Boss 0″.073 in 273°.1

The measures of the small star will give an independent value later on.

6502. Σ 1748. (8.0...11.0)

R. A. 13h 23m 24s Decl. + 22° 48′

A and B

1911.200	181°.9	5″.85
.219	179.7	5.89
1911.21	180.8	5.87

A and C (10.7)

1911.164	353°.27	149″.78
.184	353.42	149.99
.219	353.42	150.48
1911.19	353.37	150.08

No other measures of C. A and B have a common proper motion:

A. G. Ber. 0″.257 in 276°.7

6508. S 649. (5.5...8.0)

R. A. 13h 24m 3s Decl. + 60° 34′

A and BC

1911.184	110°.45	182″.28
.200	110.45	181.66
.219	110.35	181.94
.222	110.55	182.07
1911.21	110.45	181.99

No measure of this since 1824. If the measure at that time was substantially correct, A and BC have a common proper motion. B and C make Σ 1752. From meridian observations:

1875	110°.4	182″.7	A. G. Hels.

The proper motion of the principal star is:

Groombridge	0″.091	in	295°.5
Auwers	0.069	in	276.7
Boss	0.091	in	292.0

6511. Σ 1751. (7.5...10.7)

R. A. 13h 24m 41s Decl. + 9° 56′

1907.258	58°.4	5″.85
9.340	59.1	5.80
9.342	57.1	5.94
1908.65	58.2	5.86

No change.

6512. OΣ 268 *rej.* (7.0...12.5)

R. A. 13h 25m 8s Decl. + 24° 51′

A and B

1908.249	75°.2	19″.25
.266	76.5	18.95
.383	75.9	19.81
1908.30	75.9	19.34

A and C (7.4)

1908.249	258°.42	69″.83
.266	258.18	69.81
.271	258.50	69.89
1908.26	258.37	69.84

A and D (12.2)

1908.249	29°.38	84″.82
.266	29.35	84.44
.383	29.85	84.62
1908.30	29.53	84.63

From five positions of AC (1876 to 1908), each on three or more nights, the apparent motion of the principal star is:

0″.080 in 55°.5

A continuation of the measures of AB and AD will show whether or not there is any motion in C.

The proper motions by Rechenberg are:

A	0″.063	in	72°.4
C	0.010	in	173.8

6524. OΣ 269. (6.5...7.0)

R. A. 13^{h} 27^{m} 26^{s} Decl. + 35° 31′

AB and C (9.0)

1910.091	332°.38	116″.72
.093	332.08	116.81
.107	332.30	116.93
1910.10	332.25	116.82

C is DM (35°) 2461. The earlier measures are discordant in distance:

1877.46	332°.92	114″.64	1n	Bl
1880.05	332.65	116.53	1n	Bl
1880.12	332.47	115.04	1n	Bl
1880	333.3	114.3		A. G. Lund.

h 1640 is 20′ distant *sf*. There is a star 11 m, 239° : 45″.8, but nebula too diffused for good measures.

6528. β 114. (7.6...8.0)

R. A. 13^{h} 28^{m} 0^{s} Decl. — 8° 0′

1908.252	141°.9	1″.48
.266	142.1	1.45
1908.26	142.0	1.46

This pair was observed by Glaisher at the Cambridge Observatory in 1842 who used it for comparison with Mars. These measures are of special interest as confirming the slow direct motion shown by the later observations.

1842.33	126°.8	1″.38	2n

6529. S 650. (8.0...8.7)

R. A. 13^{h} 28^{m} 9^{s} Decl. — 12° 49′

1909.381	137°.77	49″.10
10.225	137.58	49.96
10.244	136.72	49.62
10.299	137.98	49.72
1910.04	137.51	49.60

The change is due to the proper motion of one of the stars.

Ristenpart 0″.244 in 253°.3

6540. H 1234. (7.2...10.9)

R. A. 13^{h} 29^{m} 4^{s} Decl. + 39° 24′

1908.249	22°.4	32″.53
8.266	22.0	32.62
9.263	22.6	32.24
1908.59	22.3	32.46

The large star is Groombridge 2013 which is given a proper motion 0″.040 in 351°.8. No early measures.

6558. 81 *Virginis.* Σ 1763. (7.5...7.5)

R. A. 13^{h} 31^{m} 18^{s} Decl. — 7° 16′

A and C (11.4)

1912.312	327°.53	140″.93
.351	327.63	140.92
.353	327.73	141.24
1912.34	327.63	141.03

No change in AB. The proper motion of 81 *Virginis,* if any, is so far uncertain.

Auwers	0″.061	in	228°.2
Boss	0.019	in	248.6

6571. Σ 1769. (7.3...9.7)

R. A. 13^{h} 32^{m} 50^{s} Decl. + 39° 47′

The three Σ stars appear to have a common proper motion of about 0″.25, and to verify this, I have connected a third star with A and C.

A and D (11.3)

1909.170	194°.80	168″.41
.244	195.45	168.55
.263	195.05	168.15
1909.23	195.10	168.37

C and D (8.2...11.3)

1909.170	175°.40	152″.07
.244	175.88	152.26
.263	175.72	152.16
1909.23	175.67	152.16

The proper motion of A is given:

Stumpe	0″.262	in	241°.3
Porter	0.242	in	239.0
Groombridge	0.247	in	238.0

6578. β 612. (6.0...6.0)

R. A. 13ʰ 33ᵐ 40ˢ Decl. + 11° 21′

AB and C (11.5)

1912.236	274°.78	130″.89
.274	274.73	130.23
.312	274.67	129.74
1912.27	274.73	130.29

Measured for the proper motion of the binary system. This has been given:

Boss 0″.112 in 264°.4

6584. H 4605. (8.0...9.7)

R. A. 13ʰ 34ᵐ 28ˢ Decl. — 29° 18′

1911.219	288°.0	17″.29

The nebula referred to by Herschel as following H 4605 is *h* 3528.

6589. Σ 1774 *rej.* (7.0...10.2)

R. A. 13ʰ 35ᵐ 39ˢ Decl. + 51° 7′

1911.142	134°.3	17″.75
.184	133.7	17.89
.200	134.3	17.97
1911.18	134.1	17.87

If the principal star has any proper motion, the companion is moving with it. Unfortunately there is no third star near enough for comparison. The supposed proper motion should be confirmed.

A. G. Harv. 0″.172 in 305°.1

6611. S 652. (8.0...8.0)

R. A. 13ʰ 38ᵐ 59ˢ Decl. — 9° 55′

A and B

1908.156	134°.58	49″.02
.192	134.38	49.12
.370	134.80	49.01
1908.24	134.59	49.05

The four positions given, including South in 1829, make the apparent motion of B:

0″.153 in 27°.0

It is obvious from the magnitudes that this proper motion may be in either, or both. I have, therefore, connected a third star:

A and C (9.9)

1908.156	339°.78	114″.04
.370	340.02	113.99
1908.26	339.90	114.01

C is SD (9°) 3766.

6616. β 115. (8.0...11.5)

R. A. 13ʰ 39ᵐ 24ˢ Decl. + 9° 40′

A and C (12.3)

1911.222	170°.50	115″.12
.260	170.25	115.20
.337	170.47	114.62
1911.27	170.41	114.98

For the proper motion of A.

Bossert 0″.132 in 213°.9

There is no material change in AB.

6646. S 655. (8.5...10.0)

R. A. 13ʰ 43ᵐ 35ˢ Decl. + 18° 17′

This star wrongly identified from W_2 in the *General Catalogue,* and the place given is that of DM (18°) 2788 (8.7). It should be (18°) 2786 (8.3), which is closely *sp* the other. The correct place (1880) is given here. The proper motion given in the *General Catalogue* is that of 2788.

The principal star of S 655 has a small proper motion. The later positions by Doo and β (1897-1911) give:

0″.076 in 291°.1

Or, if the measure by South is used:

0″.062 in 292°.3

A and B (8.5...10.0)

1907.348	80°.5	38″.83
8.039	80.7	39.11
8.063	80.9	39.38
1907.82	80.70	39.11
1911.241	80°.60	39″.56
.260	80.73	39.59
.280	80.65	39.57
1911.26	80.66	39.57

A and C (12.4)

1911.260	5°.40	61″.57
.334	5.07	62.26
1911.30	5.23	61.91

B and C

1911.260	328°.70	64″.66
.334	328.77	65.12
1911.30	328.73	64.89

6662. 10 *Draconis.* H 3342. (4.8...12.0)

R. A. $13^h 47^m 56^s$ Decl. +65° 19′

A and B

1911.260	25°.08	54″.56
.334	25.97	54.08
.337	25.43	54.93
1911.31	25.49	54.52

A and C (11.0)

1911.260	63°.10	90″.26
.334	62.87	89.96
.337	62.96	90.28
1911.31	62.98	90.17

Comparing the two recent positions with the single measure of 1879 gives for the motion of A:

AB	R. A. + 0″.021	Decl. + 0″.038
AC	+ 0.049	— 0.063

It is evident there is some error in the unverified observation, and that later on it should be rejected as all measures should be when made on a single night.

If we take a mean of the two comparison stars, the proper motion of A is:

0″.037 in 109°.6

This motion, so far as meridian positions are concerned, is wholly uncertain.

Auwers	0″.017	in	217°.3
Boss	0.004	in	140.0
Groombridge	0.005	in	292.0
Davis	0.011	in	257.8
Newcomb	0.010	in	223.9

6664. OΣ (App.) 127. (6.3...8.2)

R. A. $13^h 48^m 3^s$ Decl. +68° 55′

A and B

1912.066	65°.15	77″.79
.162	64.98	77.52
.164	64.90	77.47
1912.13	65.01	77.59

B and C (13.0)

1912.066	65°.67	44″.85
.162	65.10	45.01
.164	64.90	44.92
1912.13	65.22	44.93

The relative motion from measures to 1903 is given in the *General Catalogue.* Further proper motions of the large stars from Greenwich (1900) are:

A	0″.195	in	254°.9
B	0.098	in	287.8

The faint star is connected to verify the motion of B.

6668. Σ 1788. (6.9...7.9)

R. A. $13^h 48^m 41^s$ Decl. —7° 28′

A and C (10.8)

1907.197	293°.00	127″.03
8.039	293.32	126.88
8.156	293.02	126.71
1907.80	293.11	126.87

A and D (11.0)

1907.197	215°.10	156″.75
8.039	215.30	156.10
8.156	215.10	156.39
1907.80	215.17	156.41

For comparison we have the following measures by Engelhardt:

AC	1886.38	292°.28	130″.52	2n
	1894.32	292.67	129.69	3n
AD	1886.38	215.83	159.53	2n
	1894.32	215.68	158.75	3n

Comparing a mean of the two positions with the recent measures, we have for the proper motion of the large star:

From AC	0″.203	in	268°.6
From AD	0.182	in	246.5

The small difference is undoubtedly due to errors of observation.

Other values of this motion from meridian positions are:

Stumpe	0″.207	in	271°.4
Auwers	0.207	in	270.0
Porter	0.215	in	266.3
Boss	0.166	in	259.6

6670. η *Bootis.* Sh 169. (2.7...9.0)

R. A. $13^h 48^m 58^s$ Decl. + 19° 0′

1909.340	105°.15	113″.49
.342	105.23	113.27
.359	105.80	113.68
1909.35	105.39	113.48

The six sets of measures by OΣ, HΣ and β (1851-1909) give for the proper motion of η *Bootis:*

0″.377 in 198°.9

From meridian positions:

Auwers	0″.351	in	191°.4
Boss	0.372	in	189.9
Newcomb	0.369	in	189.8

6676. OΣ 273. (7.5...8.0)

R. A. $13^h 50^m 19^s$ Decl. + 5° 53′

AB and *h* 1703

1910.206	236°.5	238″.8
.244	236.3	238.6
.260	236.6	238.8
1910.24	236.5	238.7

h 1703 is bright, with good central condensation.

1875.40	235°.8	236″.0	1n	Wn.

6700. Σ 1798. (7.5...9.3)

R. A. $13^h\,55^m\,17^s$ Decl. $+78°\,59'$

1907.271	13°.3	7″.25
.348	13.9	7.23
1907.31	13.6	7.24

No change.

6701. τ *Virginis.* Sh 171. (4.3...8.7)

R. A. $13^h\,55^m\,33^s$ Decl. $+2°\,8'$

A and B

1912.164	290°.03	80″.37
.236	289.70	79.60
.296	289.68	79.59
1912.23	289.80	79.85

B and C (13.0)

1912.236	21°.12	157″.85
.274	21.20	158.99
.296	20.82	158.79
1912.27	21.05	158.54

Complete measures on the necessary number of nights to give a safe result are entirely wanting in the first half century. The measures of the small star since 1823 tend to show no relative motion. I have therefore connected a very faint star.

The proper motion of τ *Virginis,* derived from meridian positions, is uncertain in direction:

Auwers	0″.033	in	192°.8
Newcomb	0.033	in	151.8
Boss	0.032	in	142.0

6705. Σ 1797. (8.2...8.5)

R. A. $13^h\,56^m\,18^s$ Decl. $+20°\,1'$

1910.148	158°.4	20″.87
.167	159.5	20.88
.225	159.4	21.02
1910.18	159.1	20.92

No change since 1828.

6801. Σ 1830. (8.5...9.8)

R. A. $14^h\,11^m\,52^s$ Decl. $+57°\,13'$

A and C (12.5)

1911.260	81°.30	35″.53
.334	80.10	35.67
.337	80.37	35.55
1911.31	80.59	35.58

A and D (5.7)

1911.260	61°.60	141″.39
.334	61.87	141.96
.337	62.00	141.59
1911.31	61.82	141.65

From the measures of AB by Σ, Δ, OΣ, Hl and β (1830-1911), and the measures of the faint star C (1886-1911) the proper motion of A is:

AB	0″.044	in	164°.8
AC	0.028	in	146.3

With a longer interval for AC, the results would doubtless be identical.

The 6 m star, D, is known to have some proper motion; not in Boss' *General Catalogue.* The measures of D from A of Σ 1831 show an apparent motion of D, assuming the other to be fixed:

0″.125 in 330°.8

6802. ι *Bootis.* Σ 26, App. I. (4.9...7.5)

R. A. $14^h\,11^m\,56^s$ Decl. $+51°\,55'$

A and C (12.7)

1911.260	197°.10	85″.75
.337	197.08	85.62
.353	197.05	85.59
1911.32	197.08	85.65

For the common proper motion of AB. No other measures. The motion of A from the star catalogues is given:

Auwers	0″.170	in	300°.0
Newcomb	0.160	in	301.7
Boss	0.169	in	300.6

6803. β 1246.

R. A. $14^h\,12^m\,12^s$ Decl. $-25°\,16'$

A and C (5.5...11.0)

1910.414	97°.98	43″.20
11.260	98.73	42.98
11.334	98.57	42.87
1911.00	98.43	43.02

From the four positions of this star (1891-1911) we have for the proper motion of AB:

0″.439 in 318°.9

From the catalogues:

Porter	0″.458	in	307°.0
Boss	0.537	in	313.4

6813. β 1272. (8.4...9.5)

R. A. $14^h\,13^m\,22^s$ Decl. $+49°\,18'$

A and C (8.6)

1911.260	321°.30	23″.57
.337	321.33	23.69
.353	322.10	23.92
1911.32	321.58	23.73

No change in AC.

6828. Ho 384. (6.5...12.0)

R. A. 14ʰ 15ᵐ 42ˢ Decl. — 7° 32′

1907.348	51°.1	27″.45
8.192	50.2	27.46
8.266	49.7	27.36
1907.94	50.3	27.42

Change from proper motion of A which should be about 0″.16 in 230°. Further measures will give a definite value.

6837. Σ 1833. (7.0...7.0)

R. A. 14ʰ 16ᵐ 18ˢ Decl. — 7° 13′

B and C (12.3)

1910.206	197°.23	103″.79
.225	196.60	103.36
.260	196.23	104.09
1910.23	196.69	103.75

For the proper motion of AB.

The large stars, AB, seem to belong to the 61 *Cygni* class. The proper motion is given:

Bossert	0″.120	in	180°.0
Radcliffe	0.171	in	185.0
Porter	0.132	in	180.0

6840. H 2714. (7.6...10.2)

R. A. 14ʰ 17ᵐ 18ˢ Decl. — 19° 15′

1909.381	279°.9	24″.57
12.296	279.1	24.55
1910.79	279.5	24.56

The change is due to proper motion in A. Further measures after the proper time interval will give an accurate value for this movement.

Battermann 0″.033 in 154°.7

6858. H 546. (7.0...10.4)

R. A. 14ʰ 18ᵐ 48ˢ Decl. — 12° 49′

1911.222	43°.10	40″.16
.241	43.10	40.10
1911.23	43.10	40.13

The other measures are of late date.

h 1798 (= *h* 3569), which is about 10′ north of H 546, is too diffused and indefinite for good measures.

6864. H 2720. (8.8...13.2)

R. A. 14ʰ 19ᵐ 30ˢ Decl. + 47° 1′

1907.217	29°.3	20″.55
8.063	31.4	20.07
9.170	31.2	20.21
1908.15	30.6	20.28

No other measures.

6869. DM (24°) 2733. (9.0...9.0)

R. A. 14ʰ 20ᵐ 11ˢ Decl. + 24° 12′

A and B

1907.140	74°.4	45″.35
.197	74.5	45.26
.217	74.1	45.01
1911.164	74.30	45.11
.184	73.93	45.11
.200	74.20	45.34

The several mean results of my measures of AB are as follows:

1903.02	74°.7	45″.21	4n
1904.31	74.5	45.02	3n
1905.42	74.1	45.22	2n
1906.12	74.1	45.19	3n
1907.18	74.3	45.21	3n
1911.18	74.1	45.19	3n

It is evident that these stars have exactly the same proper motion. For star-catalogue positions see *General Catalogue,* Part II.

A and C

1907.197	119°.8	177″.32
.217	119.5	177.17
.258	119.7	177.51
.331	119.5	177.19
1909.112	119.50	175.29
.164	119.44	174.90
.186	119.35	174.96
1910.164	119.20	173.56
.167	119.20	173.49
.184	119.20	173.63
1911.142	118.83	171.97
.164	118.78	172.58
.184	119.12	172.27
.200	118.93	172.42

The results of all my measures of AC are:

1903.02	120°.6	182″.30	4n
1904.32	120.2	180.57	2n
1905.42	120.0	179.34	3n
1906.18	119.9	178.56	6n
1907.25	119.6	177.30	4n
1909.15	119.4	175.05	3n
1910.17	119.2	173.56	3n
1911.17	118.9	172.31	4n

A continuation of these measures will give the proper motion of AB with the greatest accuracy. It is absolutely certain from the measures of the exceedingly faint star *a* that C has sensible movement. These measures give for the proper motion of AB:

1″.348 in 145°.2

From the Berlin and Cincinnati meridian positions we have:

Porter 1″.381 in 143°.5

In the proper motion of A given on p. 1076 of the *General Catalogue* from the micrometer measures of AC *for* 1″.696 *read* 1″.382.

C and *a* (13.5)

1907.140	181°.8	55″.94
.197	180.5	55.16
.258	182.4	55.74
1909.112	181.28	55.53
.164	181.31	55.49
1910.186	181.37	55.72
.244	182.10	55.59
.280	181.50	55.59

The following are the results of my measures of this star:

1906.21	181°.8	55″.91	3n
1907.20	181.6	55.61	3n
1909.14	181.3	55.51	2n
1910.24	181.6	55.63	3n
1908.20	181.57	55.66	11n

It is evident from the measures that C is fixed in space.

6880. *φ Virginis.* Σ 1846. (5.2...9.7)

R. A. 14^h 22^m 2^s Decl. — 1° 41′

A and C (12.8)

1911.164	209°.13	95″.45
.200	208.98	94.89
.219	208.28	95.07
.222	208.97	95.03
1911.20	208.84	95.11

No other measures. The proper motion of *φ Virginis* is given:

Auwers	0″.153	in	269°.3
Boss	0.134	in	265.7
Newcomb	0.135	in	268.4

6881. Σ 1847. (8.5...9.8)

R. A. 14^h 22^m 14^s Decl. — 9° 40′

1907.258	261°.8	25″.95
7.348	261.8	26.13
8.192	262.8	25.88
1907.60	262.1	25.99

A and SD (9°) 3950

1907.258 Δ Decl. = 190″.80

From the measures of AB to 1903 the proper motion of A is:

0″.109 in 110°.7

6895. Σ 1854 *rej.* (7.0...10.5)

R. A. 14^h 24^m 41^s Decl. + 32° 20′

1912.312	256°.60	25″.77
.353	256.60	26.05
1912.33	256.60	25.91

Probably without change.

6896. β 117. (8.3...9.2)

R. A. 14^h 24^m 43^s Decl. — 15° 4′

A and C (12.4)

1911.395	334°.73	107″.84
.411	335.06	107.07
.414	334.50	106.90
1911.41	334.76	107.27

For proper motion of AB.

Porter 0″.424 in 153°.2

6898. H 2725. (8.7...10.6)

R. A. 14^h 24^m 52^s Decl. + 55° 3′

1907.140	138°.7	23″.25
.217	136.2	23.59
.258	138.4	23.43
1907.20	137.8	23.42

Aitken has recently found that A is a close pair (= A 1620).

6910. *ρ Bootis.* H 2728. (3.8...12.5)

R. A. 14^h 26^m 42^s Decl. + 30° 54′

1912.258	336°.28	48″.97
.274	336.03	48.86
.296	336.05	48.99
1912.27	336.12	48.94

The proper motion of the bright star given in the *General Catalogue* from the measures 1879 to 1903 is not sensibly changed.

Measures	0″.161	in	310°.8
Bossert	0.151	in	316.9
Auwers	0.166	in	318.8
Boss	0.149	in	317.6

6915. *γ Bootis.* β 616. (2.8...12.5)

R. A. 14^h 27^m 15^s Decl. + 38° 50′

1911.164	108°.20	31″.72
.222	108.08	31.19
.241	108.20	31.37
.334	108.41	31.93
.373	108.38	31.79
1911.27	108.25	31.60

The measures of this very faint star should give the proper motion of *γ Bootis* with a high degree of accuracy. From the five β positions on 14 n (1878-1911) we have:

0″.218 in 326°.7

Some of the meridian results are:

Auwers	0″.198	in	320°.5
Boss	0.182	in	322.3
Newcomb	0.180	in	323.6

6924. H 2732. (8.7...)

R. A. $14^h 28^m 19^s$ Decl. + 45° 37′

This star has no near companion. To verify the supposed proper motion, I have connected a distant star.

A and DM (45°) 2192 (9.2)

1910.184	353°.77	91″.52
.186	354.13	92.33
.203	353.55	91.88
1910.19	353.82	91.91

No exact catalogue place found for the small star. The relative places in DM give 357° : 54″, which does not correspond to the movement of A from meridian observations.

Porter 0″.244 in 286°.7

6926. Σ 1858. (7.2...8.0)

R. A. $14^h 28^m 41^s$ Decl. + 36° 7′

A and C (13.0)

1910.299	311°.82	36″.96
.318	310.73	37.11
.340	311.00	37.13
1910.32	311.18	37.07

Faint star for proper motion of A (Lalande 26599), which is given from transit positions:

Paris	0″.213	in	283°.3
Porter	0.259	in	285.7

6932. Lalande 26492. (7.0...10.5)

R. A. $14^h 24^m 44^s$ Decl. + 5° 18′

1912.274	195°.40	55″.21
.296	195.12	55.44
.312	195.83	55.40
1912.29	195.45	55.35

The only other measures are my own in 1903.

6947. H 2737. (10.4...12.5)

R. A. $14^h 33^m 49^s$ Decl. + 20° 31′

1909.227	26°.9	10″.71
.302	24.7	10.61
1909.26	25.8	10.66

No other measures. I have connected the principal star of this with the two nebulae referred to by Herschel. They are too diffused for very exact measurement.

H 2737 and *h* 1856

1909.302	341°.2	150″.2
.304	341.5	152.6
1909.30	341.3	151.4

H 2737 and *h* 1858

1909.304	136°.4	63″.7

6954. *π Bootis.* Σ 1864. (4.9...6.0)

R. A. $14^h 35^m 5^s$ Decl. + 16° 56′

A and C (10.8)

1912.164	160°.43	126″.33
.236	160.25	126.48
.274	160.08	126.10
1912.22	160.25	126.30

The faint star is connected for the proper motion of *π Bootis.* No other measures.

Auwers	0″.029	in	17°.1
Boss	0.016	in	82.8
Newcomb	0.026	in	92.8

6955. *ζ Bootis.* Σ 1865. (3.5...3.9)

R. A. $14^h 35^m 25^s$ Decl. + 14° 15′

AB and C (10.0)

1910.397	258°.62	99″.79
.414	258.93	99.66
.416	259.08	99.76
.436	258.63	99.30
1910.42	258.81	99.63

No early measures of the Herschel distant companion. The proper motion of the binary is:

Auwers	0″.041	in	108°.3
Porter	0.030	in	109.6
Newcomb	0.060	in	114.6
Boss	0.062	in	116.0

6977. Σ 1872. (7.0...8.0)

R. A. $14^h 37^m 35^s$ Decl. + 58° 29′

A and C (11.2)

1912.162	58°.07	76″.16
.164	58.17	76.26
.236	58.35	76.20
1912.19	58.20	76.21

For the proper motion of AB. No other measures.

Porter 0″.253 in 142°.1

6982. Σ 1874. (7.7...9.2)

R. A. $14^h 38^m 1^s$ Decl. + 49° 38′

1909.186	288°.60	26″.18
.263	288.75	26.39
.266	288.63	26.29
1909.24	288.66	26.29

Probably unchanged.

6993. ε *Bootis.* Σ 1877. (3.0...6.3)

R. A. 14ʰ 39ᵐ 45ˢ Decl. + 27° 35′

A and C (12.3)

1912.353	257°.13	178″.37
.411	256.70	179.06
1912.38	256.91	178.71

The proper motion of ε *Bootis* is given:

Auwers	0″.057	in	271°.0
Boss	0.048	in	279.5
Newcomb	0.048	in	281.2

6997. Σ 1876. (8.1...8.6)

R. A. 14ʰ 40ᵐ 2ˢ Decl. — 6° 53′

A and C (11.5)

1908.266	299°.65	65″.70
.370	300.28	65.83
.422	300.00	65.36
1908.35	299.98	65.63

If the single measure of Ho is correct, the components of Σ 1876 have a considerable proper motion; but it does not appear to have been recognized in the star catalogues.

6999. Σ 1879. (7.8...8.8)

R. A. 14ʰ 40ᵐ 23ˢ Decl. + 10° 10′

AB and C (12.1)

1910.340	205°.43	56″.56
.356	205.78	56.70
.375	205.28	56.84
1910.36	205.50	56.70

AB and D (10.8)

1910.340	217°.80	133″.44
.356	218.25	133.68
.375	218.10	133.90
1910.36	218.05	133.67

For proper motion of AB. This is given from meridian positions:

Porter	0″.288	in	165°.5

7034. ξ *Bootis.* Σ 1888. (4.7...6.6)

R. A. 14ʰ 45ᵐ 51ˢ Decl. + 19° 36′

A and B

1907.329	163°.0	2″.37
.351	163.4	2.81
.444	163.6	2.34
.463	161.5	2.51
.465	162.7	2.32
1907.41	162.8	2.47

A and C (13.3)

1912.351	352°.75	60″.71
.353	352.31	60.29
.411	352.70	60.53
1912.37	352.59	60.51

For the proper motion of the binary system; no other measures of the faint star. For the proper motion of ξ *Bootis* we have:

Auwers	0″.161	in	128°.8
Boss	0.168	in	129.2
Newcomb	0.167	in	122.4

7040. β 31. (8.5...10.2)

R. A. 14ʰ 46ᵐ 59ˢ Decl. + 19° 13′

A and C (12.5)

1910.164	165°.6	9″.57
.280	164.4	8.89
.299	164.0	9.06
1910.25	164.7	9.17

A and D (11.6)

1910.148	276°.75	94″.75
.164	276.73	94.99
.280	276.42	95.02
1910.20	276.63	94.92

AD for the proper motion of the triple system.

A. G. Ber.	0″.230	in	347°.9
Porter	0.223	in	343.0

7048. OΣ (App.) 131. (6.5...7.2)

R. A. 14ʰ 47ᵐ 40ˢ Decl. + 0° 5′

A and B

1912.351	212°.10	87″.67
.353	212.03	88.36
.389	211.83	87.94
1912.36	211.99	87.99

From the three positions by Δ and β (1873-1912) we have for the proper motion of one of these stars:

0″.076 in 157°.7 (± 180°)

To determine which, if only one, of these stars has this movement, I have connected with each a third small star:

A and β 942 (9.2)

1912.351	218°.90	273″.24
.353	218.76	273.54
1912.35	218.83	273.39

B and β 942

1912.351	221°.77	186″.52
.353	221.98	186.33
.389	221.92	186.17
1912.36	221.89	186.34

7060. Sh 190. (6.3...7.3)

R. A. $14^h 50^m 27^s$ Decl. — 20° 52′

As a double star, this was first observed by Sir William Herschel in 1791, and subsequently by South and Herschel, who measured the angle and distance in 1823, and entered it as No. 190 of their catalogue of double stars. It was soon found that these stars, called seventh and eighth magnitude in Sh, had an unusually large proper motion of about 2″ a year, and that there was very little relative change, thus making a system of the 61 *Cygni* type, with a movement in space exceeded only by that famous pair.

In 1878 I measured four very small stars in the field for the purpose of getting later an independent value of the proper motion of the large star. It is practically certain that no one of these faint stars can have any sensible movement. No star of this class anywhere, not attached to and moving with a much brighter star, has ever been found to have any proper motion whatever.

The recent measures of the several distant stars are as follows:

A and C

1911.219	285°.1	26″.74
.241	284.4	26.84
1911.23	284.7	26.79

A and D

1911.184	11°.82	101″.13
.219	11.12	101.53
.222	11.67	101.44
1911.21	11.54	101.37

A and E

1911.184	191°.23	45″.35
.219	191.68	45.38
.222	192.45	45.64
.241	192.07	45.34
1911.21	191.86	45.43

A and F

1911.184	324°.55	188″.49
.219	324.55	188.87
.222	324.75	188.67
1911.21	324.62	188.68

The change in the position-angle of C since 1878 amounts to more than 113°. It is now very near B, and consequently very difficult to see and measure.

Comparing these positions with those of 1878, given in the *General Catalogue*, we have for the proper motion of A:

AC	R. A. + 1″.037	Decl. — 1″.781
AD	1.057	1.735
AE	1.032	1.768
AF	1.056	1.757
	1.045	1.760

Therefore the corrected proper motion of A is:

2″.047 in 149°.30

Some of the later determinations from meridian observations of the proper motion of the principal star are:

Bonn	2″.014	in	151°.27
Porter	2.064	in	150.47
Boss	2.039	in	149.35

For the present relation of the large stars:

A and B

1911.260	296°.14	17″.88
.280	296.75	17.56
.299	296.19	17.53
.302	296.15	17.86
1911.28	296.31	17.71

From the measure by Herschel in 1836, and seven subsequent positions by Hl, Doo, and β on 26 nights, we have for the apparent motion of B:

0″.101 in 326°.67

Hence the real proper motion of this star is:

1″.948 in 149°.45

7063. A. G. 196. (9.1...9.4)

R. A. $14^h 50^m 52^s$ Decl. + 51° 7′

1910.340	139°.0	25″.53
.375	139.2	25.53
1910.36	139.1	25.53

7066. Σ 1893. (8.4...10.0)

R. A. $14^h 51^m 10^s$ Decl. + 29° 58′

1911.107	237°.5	19″.50
.142	237.5	19.52
.162	237.6	19.95
.164	237.6	19.67
1911.14	237.55	19.66

The motion is rectilinear, and undoubtedly wholly due to the proper motion of the large star. The four positions by Σ, Δ, HΣ and β (1832-1911) give for the proper motion of A:

0″.090 in 318°.3

No proper motion found in the star catalogues.

7071. H 561. (8.3...8.7)

R. A. $14^h 51^m 44^s$ Decl. — 13° 36′

A and B

1910.164	162°.33	126″.57
.260	162.33	126.83
.299	162.75	126.58
1910.24	162.47	126.66

A and C (9.3)

1910.164	261°.00	156″.50
.260	260.73	156.31
.299	260.95	156.36
1910.24	260.89	156.39

The SD number of A in Part I of the *General Catalogue* should be 4020. B and C are Nos. 4022 and 4019. The only other measures are those given in G. C. Part II.

7074. H 2756. (8.9...9.2)

R. A. $14^h\ 51^m\ 54^s$ Decl. + 8° 45′

1907.137	93°.3	27″.22
.197	94.3	27.10
.217	92.3	27.36
1907.18	93.3	27.23

Probably without change.

7077. 18 *Librae.* Σ 1894. (6.0...10.2)

R. A. $14^h\ 52^m\ 24^s$ Decl. — 10° 40′

A and B

1907.258	39°.6	19″.10
.348	39.9	19.48
.425	39.4	19.60
.444	38.9	19.36
1907.37	39.45	19.38

A and C (10.0)

1907.258	40°.80	161″.60
.348	40.80	161.70
.425	40.93	161.47
1907.34	40.84	161.59

The measures of C, with two positions by Engelhardt in 1887 and 1894, give for the proper motion of 18 *Librae:*

0″.117 in 263°.2

From the star catalogues:

Auwers	0″.143	in	239°.8
Boss	0.131	in	234.4

A and B are moving together.

7079. β 1085. (6.0...13.2)

R. A. $14^h\ 52^m\ 37^s$ Decl. — 4° 30′

1907.258	23°.4	9″.28
9.227	23.4	9.38
1908.24	23.4	9.33

Common proper motion.

Porter 0″.413 in 254°.7

7088. Σ 1896.

R. A. $14^h\ 54^m\ 2^s$ Decl. + 44° 32′

A and DM (44°) 2407 (8.3...9.3)

1910.093	335°.95	59″.59
.107	336.08	59.62
.128	336.20	60.11
1910.11	336.08	59.77

The change shown by the single measure of 1895 may not be real.

7095. Σ 1899. (7.2...9.7)

R. A. $14^h\ 55^m\ 20^s$ Decl. — 2° 41′

1907.137	67°.1	28″.10
.197	67.0	28.03
.258	67.6	28.13
1907.20	67.2	28.09

No change. The principal star is given:

Bossert 0″.10 in 180°

7097. H 2760. (9.3...10.0)

R. A. $14^h\ 55^m\ 48^s$ Decl. + 6° 6′

1907.137	21°.1	19″.41
.197	21.0	19.34
1907.17	21.0	19.37

No early measures.

7098. Σ 1901. (7.7...9.5)

R. A. $14^h\ 55^m\ 59^s$ Decl. + 31° 51′

1907.197	198°.0	25″.26
.214	197.5	25.47
.217	197.5	24.86
1907.21	197.7	25.20

Change from proper motion of A. The measures (1831-1907) give:

Measures	0″.079	in	231°.8
A. G. Harv.	0.065	in	360.

A and DM (31°) 2685

1907.197	Δ Decl. 110″.09
.214	109.80

The A. G. positions give 112″.3 (1871.3), and confirm the motion in declination.

7108. Ho 391. (8.0...11.0)

R. A. $14^h\ 57^m\ 47^s$ Decl. — 6° 24′

A and C (12.0)

1910.375	298°.73	41″.36
.395	299.83	41.24
1910.38	299.28	41.30

For the proper motion of AB. The prior measures are given in Part II of the *General Catalogue.*

Bossert	0″.227	in	246°.7
Porter	0.268	in	259.3
Paris	0.224	in	247.7

7120. 44 *Bootis.* Σ 1909. (5.2...6.1)

R. A. $14^h\,59^m\,51^s$ Decl. +48° 7′

1908.271	243°.8	4″.21
.370	244.8	4.19
.383	243.4	4.20
.403	241.7	4.23
1908.36	243.4	4.21

We have for the proper motion of the system:

Auwers	0″.433	in	273°.0
Porter	0.401	in	276.0
Newcomb	0.377	in	275.9
Boss	0.388	in	274.6

7125. H 1268. (8.7...12.2)

R. A. $15^h\,0^m\,42^s$ Decl. +6° 15′

1910.164	92°.3	28″.31
.206	92.5	28.47
.244	92.6	28.42
1910.20	92.5	28.40

No other measures. H 2762, which should be 22′ *n* of this, not found.

7136. β 349. (7.5...11.8)

R. A. $15^h\,2^m\,52^s$ Decl. +2° 9′

1909.438	37°.8	3″.83
09.458	36.6	3.31
10.164	36.1	3.41
1909.69	36.8	3.52

The nebula 55′ nearly north is brighter in the center, but bisection not very exact.

h 1903 and star 10.8 m

1909.458	108°.55	114″.95
10.164	109.00	114.15
1909.81	108.77	114.55

For comparison we have:

1893.42	109°.8	112″.4	1n	Eng.

There are two small nebulae about $2\frac{1}{2}^m$ and $3\frac{1}{2}^m$ *p* β 349, and nearly the same declination.

h 1901 and star 12 m

1910.244	277°.0	140″.73

Dreyer 5839 and star 12.5 m

1910.244	91°.8	92″.50

For the first we have:

1886.96	276°.7	140″.5	1n	Eng.

7154. Weisse 28.

R. A. $15^h\,6^m\,3^s$ Decl. −14° 15′

This star is not double. *h* 3593 is about 30′ distant *nf;* little brighter in the center.

h 3593 and star 12.7 m

1910.395	51°.6	144″.21
.414	52.8	144.49
1910.40	52.2	144.35

7181. OΣ 292 *rej.* (6.5...8.0)

R. A. $15^h\,9^m\,11^s$ Decl. +32° 14′

1909.400	155°.82	125″.22
.438	155.57	125.12
1909.42	155.70	125.17

Probably a little proper motion in one; no early measures.

1825	153°.1	130″.3		Weisse
1875	155.0	126.9		A. G. Leid.
1899.59	155.2	125.91	2n	Hu

7186. OΣ 294. (6.8...11.3)

R. A. $15^h\,9^m\,47^s$ Decl. +56° 30′

A and B

1910.164	249°.5	3″.28
.184	248.4	3.23
.186	245.8	2.91
.225	248.8	3.24
1910.19	248.1	3.16

No change in the small star.

A and Groombridge 2203

1875	Δ R. A. — $62^s.2$	Δ Decl. — 70″.5	A. G. Hels.
1890	61.9	70.5	Greenwich
1910.18	61.9	70.6	β

A is Groombridge 2209. The proper motions are practically zero:

Groom. 2209	0″.009	in	320°.6
Groom. 2203	0.010	in	39.4

The large diffused nebula, *h* 1909 is about 50′ distant *sp;* bisection rather uncertain:

h 1909 and star 11.0 m

1910.164	331°.5	88″.73
.184	333.9	88.83
1910.17	332.7	88.78

h 1909 and star 10.7 m

1910.164	227°.6	88″.83
.184	231.9	88.83
1910.17	229.7	88.83

The prior observations are:

1877.59	336°.2	92″.5	1n	Wn
1877.59	231.2	86.7	1n	Wn.

7187. OΣ 293. (7.5...11.0)

R. A. $15^h\ 10^m\ 10^s$ Decl. + 22° 59′

1909.400	346°.3	10″.84
.438	348.3	10.80
1909.42	347.3	10.82

No third star near enough. Common proper motion in AB.

A. G. Ber.	0″.112	in	280°.5

7193. Σ 1925. (7.8...9.3)

R. A. $15^h\ 10^m\ 28^s$ Decl. — 7° 50′

A and B

1911.302	12°.6	5″.15
.334	14.1	4.99
.337	13.2	5.26
1911.32	13.3	5.13

A and B have a common proper motion.

Bossert	0″.234	in	206°.3
Valentiner	0.254	in	206.4
Porter	0.254	in	206.3

A and C (13.2)

1911.302	271°.32	65″.52
.395	270.77	66.50
.411	269.48	66.34
1911.37	270.52	66.12

A and D (12.8)

1911.392	276°.77	125″.62
.395	276.23	124.75
.411	276.50	125.29
1911.40	276.50	125.22

A and E (12.0)

1911.392	271°.32	217″.10
.395	271.40	217.32
.411	271.30	217.12
1911.40	271.34	217.18

No other measures of the small stars.

7201. β 227. (7.2...9.5)

R. A. $15^h\ 12^m\ 7^s$ Decl. — 23° 50′

About 15′ distant *np* β 227 is *h* 3598; small with central condensation.

h 3598 and Cord. DM (23°) 12193 (10.0)

1911.414	308°.3	93″.17

h 3597 and star 10.8

1911.414	262°.8	110″.18

The latter is similar to the other, and about 31^s *p*.
The proper motion of β 227 is given:

Battermann	0″.091	in	244°.1

7202. OΣ (App.) 137. (6.7...8.5)

R. A. $15^h\ 12^m\ 11^s$ Decl. + 51° 23′

1911.241	105°.69	73″.65
.258	105.50	73.17
.260	105.50	73.48
1911.25	105.56	73.43

The change seems to be wholly due to the proper motion of the large star. There is no third star convenient to measure. From the four positions the apparent proper motion of A is:

0″.088 in 145°.5

From the catalogues this is:

A. G. Harv.	0″.079	in	165°.7
Battermann	0.055	in	158.9

7210. Σ 1931. (6.2...7.6)

R. A. $15^h\ 12^m\ 57^s$ Decl. + 10° 52′

A and B

1908.249	170°.7	13″.33
.252	170.1	13.11
.266	169.4	13.29
1908.26	170.1	13.24

No relative motion in AB. I do not find it in any proper motion list. In this interest I have connected a third star.

A and C (11.4)

1908.249	93°.05	162″.18
.266	92.65	162.06
1908.26	92.85	162.12

7212. Σ 1934. (8.5...8.5)

R. A. $15^h\ 13^m\ 10^s$ Decl. + 44° 14′

A and B

1911.219	27°.0	7″.05
.241	26.6	7.14
1911.23	26.8	7.09

From six positions by Σ, Ma, Δ, Hl, Doo and β on 31 n (1830-1911) one of these stars has a proper motion of:

0″.034 in 168°.3 (± 180°)

As these stars are of about the same brightness, the motion may be in either. To determine which is moving, I have connected a third small star.

A and C (10.7)

1911.219	217°.75	140″.69
.221	217.87	140.55
.241	217.70	140.70
1911.23	217.77	140.65

7213. 5 *Serpentis.* Σ 1930. (5.0...10.0)

R. A. $15^h 13^m 10^s$ Decl. + 2° 14′

A and B

1907.463	37°.9	10″.93

A and C (12.0)

1907.351	45°.40	125″.43
.444	45.55	125.28
.463	45.87	125.14
1907.42	45.61	125.28

1911.241	44°.55	125″.38
.260	44.37	124.92
.299	44.80	124.98
1911.27	44.57	125.09

From the three positions of this star (1887-1911) we have for the proper motion of 5 *Serpentis:*

0″.590 in 140°.7

A and D

1911.25 Δ R. A. — $44^s.98$ Δ Decl. — 24″.93

The prior observations of D will be found in the *General Catalogue.*

From meridian positions the proper motion of 5 *Serpentis* is:

Auwers	0″.638	in	146°.0
Bossert	0.649	in	146.3
Boss	0.645	in	147.1

7224. H 2776. (10.1...12.5)

R. A. $15^h 15^m 16^s$ Decl. + 46° 16′

1909.227	312°.5	19″.64
.266	310.7	19.88
.302	311.3	19.24
1909.26	311.5	19.59

No other measures. The object in the field, referred to by Herschel, is *h* 1920; very diffused and bisection rather uncertain.

H 2776 and *h* 1920

1909.302	13°.0	170″.89
.304	12.4	170.31
1909.30	12.7	170.60

7237. Σ 3093. (8.0...9.2)

R. A. $15^h 16^m 27^s$ Decl. — 1° 6′

1910.164	142°.5	28″.45
.356	142.6	28.08
.395	141.9	28.56
1910.31	142.3	28.36

The four positions by Σ, Δ, Doo and β (1829-1910) give for the proper motion of A:

0″.076 in 105°.0

7244. H 2779. (7.0...11.0)

R. A. $15^h 17^m 28^s$ Decl. + 55° 45′

1911.260	349°.6	11″.03
.337	348.9	11.07
.353	349.5	11.09
1911.32	349.3	11.06

Probably fixed. No proper motion found for the large star.

7251. η *Coronae.* Σ 1937.

R. A. $15^h 18^m 15^s$ Decl. + 30° 43′

AB and C

1907.331	14°.40	54″.72
7.348	14.00	54.76
8.039	13.58	55.38
8.156	14.00	54.94
1907.72	14.00	54.95

The measure I have given by Lamont in 1836 is wholly wrong, and probably belongs to some other star. The relation at this time must have been about 29° : 45″.

The measures of 1856 and 1907 give for the proper motion of η *Coronae:*

0″.233 in 142°.5

AB and D (11.0)

1909.340	47°.32	214″.25
.342	47.35	214.24
.378	47.68	214.19
1909.35	47.45	214.23

For comparison we have:

1879.97	48°.96	212″.82	3n	Bl.

Further measures should be made after a suitable interval to give the best correction to the proper motion of AB. From the two positions that motion is:

0″.197 in 152°.3

Some of the results from the star catalogues are:

Auwers	0″.219	in	150°.7
Porter	0.217	in	148.5
Boss	0.237	in	146.6
Newcomb	0.235	in	147.8

7258. μ *Bootis.* Σ 28, App. I.

R. A. $15^h 19^m 58^s$ Decl. + 37° 48′

A and BC

1910.109	171°.35	107″.96
.128	171.33	107.86
.145	171.50	108.17
.148	171.33	107.92
.164	171.20	107.97
1910.14	171.34	107.98

Very little change if any since 1834. The proper motion of the large star is:

Auwers	0″.189	in	296°.4
Bossert	0.158	in	296.2
Boss	0.169	in	297.5

7268. Sh 202. (7.2...7.5)

R. A. $15^{h}\,21^{m}\,40^{s}$ Decl. −8° 55′

B and SD (8°) 3984 (10.5)

1910.356	109°.73	166″.69
.395	109.58	166.17
.397	109.46	166.47
1910.38	109.59	166.44

For proper motion of AB.

The proper motions by Porter are:

A	0″.339	in	172°.0
B	0.355	in	158.4

As these stars have remained relatively fixed for half a century, the motions must be exactly the same.

7276. OΣ 296. (7.0...8.6)

R. A. $15^{h}\,22^{m}\,18^{s}$ Decl. + 44° 26′

A and C (12.1)

1911.260	315°.73	67″.23
.337	315.97	67.33
.356	315.73	67.41
1911.32	315.81	67.32

No other measures of C. The principal star, Lalande 28230, is given some proper motion:

Bossert	0″.178	in	106°.3
Boss	0.105	in	125.4

DM (44°) 2466 and 2468

1911.337	47°.70	157″.07
.353	47.92	156.93
1911.34	47.81	157.00

These 9.3 m stars are about 10′ *s* of OΣ 296. The meridian positions give:

1875	46°.5	156″.1	A. G. Bonn

7277. Σ 1945. (8.8...9.5)

R. A. $15^{h}\,22^{m}\,26^{s}$ Decl. + 15° 7′

A and B

1908.249	292°.8	32″.47
.288	292.6	33.00
.331	292.7	32.42
1908.29	292.7	32.63

From the measures of Σ, Δ and β (1830-1908) the proper motion of the larger star is:

0″.140 in 182°.3

To make it certain hereafter that B has no motion, I have connected two small stars.

B and C (9.5)

1908.249	281°.4	8″.84
.288	281.4	9.04
.331	282.9	9.06
1908.29	281.9	8.98

A and E (10.7)

1908.249	54°.15	146″.22
.288	54.15	146.26
1908.27	54.15	146.24

7289. Ho 393. (9.2...13.0)

R. A. $15^{h}\,24^{m}\,21^{s}$ Decl. — 18° 27′

A and B

1908.479	287°.1	6″.56
10.395	280.2	7.01
1904.44	283.6	6.78

Perhaps change in AB, but the distances are very discordant.

A and SD (18°) 4083 (7.9)

1908.479	313°.98	168″.84
08.842	313.90	168.42
10.395	312.88	168.53
1909.12	313.59	168.60

The SD approximate places give 305° : 155″.

7302. β 945. (6.8...12.7)

R. A. $15^{h}\,26^{m}\,6^{s}$ Decl. + 57° 51′

1908.425	44°.5	15″.80
.444	44.3	15.66
.460	45.9	15.81
1908.44	44.9	15.76

The seven positions by β, A and Doo (1879-1908) give for the corrected proper motion of the principal star:

0″.302 in 301°.4

This is given from the star catalogues:

Stumpe	0″.304	in	297°.4
Krueger	0.295	in	298.5
Porter	0.308	in	299.1

7314. γ *Librae.* (4.5...11.7)

R. A. $15^{h}\,28^{m}\,48^{s}$ Decl. — 14° 23′

1912.487	152°.84	41″.90
.504	152.80	41.72
.507	153.40	41.98
1912.49	153.01	41.87

The measures of the small star indicate a smaller proper motion of γ *Librae* than that of the star catalogues, but the first position depends on a single night, and therefore the result is uncertain, and the measures should be continued.

From meridian observations we have:

Auwers	0″.057	in	70°.6
Newcomb	0.069	in	84.7
Boss	0.065	in	90.9

7315. H 2886. (8.1...11.5)

R. A. $15^h\ 28^m\ 52^s$ Decl. + 38° 52′

1911.356	166°.8	23″.37
.375	168.0	23.30
.392	.....	23.37
1911.37	167.4	23.35

No other measures.

7318. δ *Serpentis*. Σ 1954. (3.0...4.0)

R. A. $15^h\ 29^m\ 5^s$ Decl. + 10° 56′

A and C (13.5)

1911.392	11°.30	65″.61
.395	11.80	65.87
.411	11.50	65.89
1911.40	11.53	65.79

C and D (14.0)

1911.392	338°.5	4″.35
.395	339.6	4.08
.411	338.4	4.61
1911.40	338.8	4.35

For the proper motion of AB. No other measures.

Auwers	0″.087	in	286°.0
Boss	0.068	in	276.7

7320. OΣ 297. (7.5...11.5)

R. A. $15^h\ 29^m\ 40^s$ Decl. + 25° 24′

1911.142	135°.4	3″.26
.200	134.5	3.26
.260	133.0	3.21
1911.20	134.3	3.24

The minimum distance of these stars will be about 1″.

From 8 positions by Σ, OΣ, Δ, A, Hu, Doo and β on 24 n (1845-1911) the proper motion of A is:

0″.157 in 151°.6

7326. Σ 1961. (8.7...9.0)

R. A. $15^h\ 30^m\ 29^s$ Decl. + 43° 56′

A and B

1910.128	38°.17	23″.52
.148	38.00	23.49
.164	38.20	23.44
1910.15	38.12	23.48

A and C (12.9)

1910.128	328°.90	55″.02
.148	328.20	55.04
.164	327.83	54.82
1910.15	328.31	54.96

The very faint star is measured for the verification of the proper motion of A.

The apparent motion from the measures of AB (1830-1910) is:

0″.091 in 152°.0

7327. H 2788. (8.5...8.5)

R. A. $15^h\ 30^m\ 39^s$ Decl. + 45° 18′

1912.236	304°.93	56″.83
.274	304.37	56.92
.296	304.38	56.95
1912.27	304.56	56.90

From a comparison of this with the only other measures (1903), it is evident that one of these stars has a small proper motion of about 0″.10. This is confirmed by the meridian positions:

1875	304°.8	60″.8	A. G. Bonn

7332. OΣ 298. (7.0...7.3)

R. A. $15^h\ 31^m\ 46^s$ Decl. + 40° 12′

AB and C (7.0)

1910.148	327°.78	121″.71
.164	327.83	121.67
.167	328.00	122.02
1910.16	327.87	121.80

C has the same large proper motion as AB.

Porter 0″.514 in 278°.3

h 1930 is in the field; small, round, and not well defined for measurement.

AB and *h* 1930

1910.128	234°.8	195″.5
.203	234.4	193.6
.244	233.8	195.5
1910.19	234.3	194.9

For the last we have:

1886.31	236°.2	205″.5	1n	Big
1889.49	236.2	201.2	1n	Big
1890.64	236.0	203.1	1n	Big.

7341. Σ 1963. (7.3...7.7)

R. A. $15^h\ 33^m\ 1^s$ Decl. + 30° 30′

A and B

1908.252	294°.2	4″.70
.266	294.3	4.80
.288	294.1	4.67
1908.27	294.2	4.72

No change.

A and C (12.5)

1908.266	116°.28	31″.12
.288	115.75	30.89
.370	115.70	31.01
1908.31	115.91	31.01

No other measures of the small star.

7359. β 35. (7.1...8.2)

R. A. $15^h\,36^m\,1^s$ Decl.— 15° 38′

A and SD (15°) 4167 (10.0)

1910.455	35°.78	112″.17
.471	35.63	112.27
.473	35.40	112.56
1910.47	35.60	112.33

For proper motion of AB.

Porter	0″.185	in	250°.5

7360. ι *Serpentis.* Hu 580.

R. A. $15^h\,36^m\,12^s$ Decl. + 20° 3′

AB and C (13.4)

1912.353	351°.03	141″.29
.411	351.10	141.36
.430	350.80	142.50
1912.40	350.98	141.72

AB and D (12.6)

1912.389	111°.05	148″.89
.411	111.00	149.86
.430	111.13	148.90
1912.41	111.06	149.22

The proper motion of the close pair is given:

Auwers	0″.096	in	253°.0
Boss	0.090	in	232.6

7361. OΣ (App.) 141. (7.0...9.0)

R. A. $15^h\,36^m\,12^s$ Decl. + 57° 51′

A and B

1911.356	205°.23	90″.52
.373	204.93	90.79
.375	205.00	90.53
1911.37	205.05	90.61

The measures by Δ, Fr and β on 12 n (1876-1911) give for the proper motion of the large star:

0″.044 in 242°.8

From meridian positions:

Groombridge	0″.013	in	193°.8

A and C (7.0)

1911.375	334°.80	234″.36
.392	335.12	234.96
.395	335.27	234.39
1911.39	335.06	234.57

C is Groombridge 2265. This is given a small proper motion:

Groombridge	0″.014	in	15°.8

7362. π^1 *Ursae Min.* Σ 1972. (6.1...7.0)

R. A. $15^h\,36^m\,13^s$ Decl. + 80° 51′

B and C (11.0)

1911.356	103°.67	131″.49
.373	103.80	131.22
.375	103.37	131.35
1911.37	103.61	131.35

For the common proper motion of AB. C should be in the *Astrographic Catalogue.*

For the proper motion of the principal star we have:

Stumpe	0″.225	in	296°.7
Bossert	0.206	in	309.1
Boss	0.245	in	298.2
Groombridge	0.235	in	303.6

7364. Σ 1971 *rej.* (8.9...11.8)

R. A. $15^h\,37^m\,13^s$ Decl. + 75° 43′

1907.348	324°.4	17″.38
8.041	323.8	17.26
8.112	323.9	17.16
1907.83	324.0	17.27

This pair has not been previously measured.

7371. Σ 3095.

R. A. $15^h\,38^m\,15^s$ Decl. — 14° 48′

These measures are of the pair in the field with Σ 3095. (See *General Catalogue.*)

A and B (10.0...10.6)

1911.302	204°.09	20″.24
.334	203.94	20.08
.337	203.48	20.56
1911.32	203.84	20.29

A and Σ 3095 (A)

1911.30 Δ R. A. — $43^s.3$ Δ Decl. + 7″.3

7372. α *Serpentis.* H 1277. (2.7...12.0)

R. A. $15^h\,38^m\,21^s$ Decl. + 6° 48′

1911.162	349°.85	58″.59
.164	349.76	58.15
.184	349.28	58.33
.200	349.92	58.58
1911.18	349.70	58.41

The four positions by Doo and β (1878-1911) tend to show that the proper motion from meridian observations is too large.

Measures	0″.112	in	82°.7
Auwers	0.130	in	64.5
Newcomb	0.139	in	72.4
Boss	0.139	in	74.2

7384. H 1278. (8.5...10.7)

R. A. $15^h 40^m 29^s$ Decl. — 15° 48′

1909.378	128°.4	26″.68
.381	128.5	26.92
1909.38	128.4	26.80

Only a single measure prior to this.

7386. β *Serpentis.* Σ 1970. (3.0...9.2)

R. A. $15^h 40^m 39^s$ Decl. + 15° 48′

A and C (10.0)

1912.353	208°.66	199″.80
.389	208.88	199.55
.411	208.63	200.23
1912.38	208.72	199.86

The large stars have a common proper motion. No other measures.

Auwers (Brad.)	0″.060	in	125°.5
Auwers (F. C.)	0.059	in	134.4
Boss	0.091	in	128.9

7394. Σ 1976. (8.2...8.2)

R. A. $15^h 42^m 33^s$ Decl. + 59° 48′

A and B

1909.266	71°.5	19″.36
.299	71.5	19.19
.302	71.7	19.08
1909.29	71.6	19.21

No change since 1831. There is a 13 m star nearer A:

341°.3 : 15″.0

To detect proper motion, if any, in Σ 1976, I have measured a distant 10 m star:

A and C

1909.266	214°.05	133″.60
.299	213.88	133.71
.302	213.75	133.33
1909.29	213.89	133.55

The large nebula, *h* 1934, is about 6^m directly *p*.

7404. β 415. (8.5...11.5)

R. A. $15^h 44^m 50^s$ Decl. + 65° 57′

A and B

1907.217	335°.3	12″.65
.258	335.2	12.80
.351	335.7	12.64
1907.28	335.4	12.70

Relatively fixed since 1876.

A and C (12.0)

1907.217	358°.9	27″.60
.258	359.1	27.94
.351	358.7	28.03
1907.28	358.9	27.86
1910.280	359°.08	27″.60
.299	359.05	27.70
1910.29	359.06	27.65

Change in AC from proper motion of A.

C and D (13.0)

1907.258	7°.1	55″.54
.351	6.0	54.85
1907.30	6.5	55.20

There is a 14 m star nearer C.

7411. H 574. (9.0...11.8)

R. A. $15^h 45^m 35^s$ Decl. + 32° 46′

A and B

1908.249	93°.0	15″.95
.266	92.4	15.97
.425	93.4	15.97
1908.31	92.9	15.96

A and C (10.0)

1908.249	99°.35	77″.52
.266	99.05	77.44
.425	99.78	76.84
1908.31	99.39	77.27

No other measures.

7422. Σ 1983. (8.7...10.8)

R. A. $15^h 47^m 27^s$ Decl. + 35° 49′

1908.291	71°.0	15″.75
.370	71.9	15.75
.383	71.9	16.18
1908.35	71.6	15.89

The four positions by Σ, Δ and β (1830-1908) give the proper motion of A:

0″.027 in 117°.1

7428. Σ 1984. (6.2...8.5)

R. A. $15^h 48^m 1^s$ Decl. + 53° 16′

A and C (12.5)

1910.280	97°.92	170″.75
.299	98.12	171.00
.318	97.70	170.69
1910.30	97.91	170.81

For proper motion, if any, in AB. No other measures.

A. G. Harv.	0″.090	in	270°.0
Groombridge	0.027	in	248.2

7437. H 1281. (6.8...11.5)

R. A. 15ʰ 50ᵐ 17ˢ Decl. — 15° 41′

1911.302	231°.5	34″.09
.337	231.7	34.99
.392	230.4	35.01
.395	232.4	34.93
1911.36	231.5	34.75

Change uncertain.

7442. *λ Coronae Bor.* H VI. 94. (5.7...9.5)

R. A. 15ʰ 51ᵐ 25ˢ Decl. + 38° 18′

1911.107	64°.13	96″.54
.142	64.87	96.18
.162	64.63	96.95
.164	64.75	96.67
1911.14	64.59	96.58

The three positions (1879-1911) give for the proper motion of the large star:

0″.065 in 49°.7

Further measures are needed for a final value.

Auwers	0″.091	in	23°.4
Boss	0.084	in	31.2

7443. H 2798. (10.6...11.1)

R. A. 15ʰ 51ᵐ 35ˢ Decl. + 17° 48′

A and B

1907.217	30°.1	8″.07
.233	30.1	7.94
.258	30.4	7.44
1907.24	30.2	7.82

A and C (9.0)

1907.217	171°.9	48″.62
.233	172.1	49.29
.258	172.4	49.14
1907.24	172.1	49.02

There is probably an error of 10″ in Dembowski's distance of 58″.49, or perhaps one-half a revolution giving 47″.95 for the distance. C is DM (17°) 2936.

7451. H 258. (9.5...10.0)

R. A. 15ʰ 52ᵐ 26ˢ Decl. + 36° 33′

1909.304	255°.1	16″.54
.340	254.8	16.75
.342	254.5	16.72
1909.33	254.8	16.67

The only other measure is by Dembowski on a single night in 1873.

7453. *ε Coronae.* A. G. Clark 7. (4.2...12.0)

R. A. 15ʰ 52ᵐ 37ˢ Decl. + 27° 14′

A and C (11.5)

1912.353	175°.83	105″.52
.389	175.55	104.25
.411	175.17	105.74
1912.38	175.52	105.17

The proper motion of *ε Coronae* from the star catalogues is:

Auwers (F. C.)	0″.117	in	237°.9
Boss	0.109	in	231.5
Newcomb	0.110	in	232.6

7460. Σ 1996. (8.7...9.0)

R. A. 15ʰ 53ᵐ 26ˢ Decl. + 57° 38′

A and B

1910.340	108°.35	19″.36
.356	108.60	19.49
.375	108.40	19.50
1910.36	108.45	19.45

No recent measures. Probably fixed. Wrongly identified in Part I of the *General Catalogue;* not in DM, but closely *f* the O. Arg. star.

A and DM (57°) 1621 (9.0)

1910.356	141°.15	150″.29
.375	141.03	149.94
1910.37	141.09	150.11

7466. Σ 1993. (8.2...8.2)

R. A. 15ʰ 54ᵐ 22ˢ Decl. + 17° 43′

One of the components of Σ 1993 has a proper motion of 0″.76 in about 38° (± 180°). I have therefore connected a distant star.

A and Σ 1994 *rej.*

1910.299	179°.12	242″.28
.318	179.00	242.57
.337	178.70	242.42
1910.32	178.94	242.42

7473. Ho 400. (8.0...13.0)

R. A. 15ʰ 54ᵐ 54ˢ Decl. + 16° 1′

1911.200	131°.6	10″.80
.219	133.0	10.97
1911.21	132.3	10.88

Change uncertain.

h 1942 and *h* 1943 are distant about 45′ *np* Ho 400.

h 1942 and star 11 m

1911.219	160°.7	179″.0

h 1943 and same star

1911.219	27°.9	142″.7

7477. OΣ 303. (7.4...7.9)

R. A. $15^h\ 55^m\ 18^s$ Decl. + 13° 37′

AB and C (13.0)

1912.241	11°.67	77″.19
.430	11.27	77.02
.465	11.55	76.75
1912.43	11.50	76.99

No proper motion of the binary found in the catalogues referred to. No other measures of C.

7480. *ρ Coronae Bor.* S 676. (5.5...9.6)

R. A. $15^h\ 56^m\ 28^s$ Decl. + 33° 40′

1912.236	75°.58	84″.86
.274	75.93	84.71
.296	75.38	84.48
1912.27	75.63	84.68

In the *General Catalogue* I have given the proper motion of *ρ Coronae* from the measures 1853 to 1903. This will not be sensibly changed by these measures.

The several results are:

Measures	0″.795	in	194°.8
Auwers	0.815	in	196.0
Porter	0.810	in	196.1
Boss	0.810	in	195.3

7490. Σ 2006. (7.5...9.2)

R. A. $15^h\ 58^m\ 1^s$ Decl. + 59° 16′

A and C (7.7)

1911.142	217°.65	44″.99
.162	218.10	45.23
.184	217.88	44.85
1911.16	217.88	45.02

Change in both companions.

No suitable fourth star for comparison.

7500. Σ 2007. (6.5...8.0)

R. A. $16^h\ 0^m\ 27^s$ Decl. + 13° 39′

A and B

1908.288	325°.4	34″.80
.331	324.9	35.09
.425	325.5	34.65
1908.35	325.3	34.85

One of the Σ components has a small proper motion, and it is impossible to say which it is. I have, therefore, connected a third small star, which is DM (13°) 3066. Remeasuring this after a proper interval will show what the fact is.

A and C (9.8)

1908.288	137°.68	167″.88
.331	137.40	167.61
.422	137.70	167.62
1908.35	137.59	167.70

7508. A. G. 202. (9.1...9.2)

R. A. $16^h\ 2^m\ 1^s$ Decl. + 47° 59′

1910.280	283°.5	22″.21
.299	284.0	22.14
.356	283.7	21.94
1910.31	283.7	22.10

7514. *κ Herculis.* Σ 2010. (5.0...6.0)

R. A. $16^h\ 2^m\ 40^s$ Decl. + 17° 22′

A and C (13.3)

1912.353	213°.43	62″.25
.389	211.72	63.21
.411	211.67	62.74
1912.38	212.27	62.73

The small relative change in AB is probably due to a small difference in their proper motions, thus making a system of the 61 *Cygni* type. The movement of the principal star is given in the star catalogues:

Auwers	0″.088	in	262°.8
Boss	0.047	in	252.5

7535. OΣ (App.) 143. (6.3...8.2)

R. A. $16^h\ 5^m\ 15^s$ Decl. + 70° 35′

1907.291	84°.7	46″.54
.329	84.5	46.85
.351	83.9	46.63
1907.32	84.4	46.67

No relative change. The proper motion of the larger star is:

Groombridge	0″.043	in	49°.8

7550. Σ 2019 *rej.* (8.0...9.2)

R. A. $16^h\ 7^m\ 42^s$ Decl. — 10° 7′

1910.260	152°.95	22″.54
.356	152.38	22.06
.395	152.95	22.38
1910.34	152.76	22.33

Probably unchanged.

7551. 49 *Serpentis.* Σ 2021. (6.7...6.9)

R. A. $16^h\ 7^m\ 42^s$ Decl. + 13° 51′

A and C (10.1)

1909.381	124°.60	240″.14
.400	124.52	240.43
.438	124.80	240.34
1909.41	124.64	240.30

Comparing this with the three measures by OΣ and HΣ, each on 1 n, we have for the proper motion of AB:

0″.477 in 159°.2

Some of the other values are:

Auwers	0″.448	in	159°.4
Bossert	0.459	in	159.6
Porter	0.433	in	160.5
Boss	0.459	in	158.4

7562. Σ 2031 *rej.* (7.6...9.7)

R. A. 16h 10m 9s Decl. — 1° 21′

1910.356	230°.38	20″.44
.395	230.22	20.74
.397	229.43	20.57
1910.38	230.01	20.58

The measures do not appear to show any proper motion in A.

A. G. Nico. 0″.105 in 270°.0

7563. σ *Coronae Bor.* Σ 2032. (5.0...6.1)

R. A. 16h 10m 11s Decl. + 34° 10′

A and D (10.5)

1908.288	86°.08	63″.16
.331	85.80	63.34
.370	85.78	63.40
.383	85.73	63.28
1908.34	85.85	63.29

The seven sets of measures of this small star by Σ, Δ Je, Do and β (1836 to 1908) should give a more accurate value of the proper motion of the principal star than that found by meridian observations. From the micrometer we have:

0″.276 in 258°.5

Some of the results from meridian positions are:

Auwers	0″.326	in	259°.2
Porter	0.280	in	258.9
Newcomb	0.287	in	255.8
Boss	0.303	in	252.1

7570. υ *Coronae Bor.* Sh 223. (5.9...12.5)

R. A. 16h 11m 56s Decl. + 29° 27′

A and B

1911.411	28°.26	54″.77
.430	28.05	54.58
.433	28.48	54.25
1911.42	28.26	54.53

A and C (10.8)

1911.411	22°.41	86″.54
.430	22.46	86.27
.433	21.92	86.63
1911.42	22.26	86.48

A and D (10.0)

1911.411	51°.98	123″.84
.430	51.65	123.61
.433	51.75	123.56
1911.42	51.79	123.67

C and E (11.5)

1911.411	226°.2	13″.24
.430	225.1	13.23
.433	224.7	13.39
1911.42	225.3	13.29

Comparing the present positions with the prior measures by Doo and β, we have for the annual change in the large star:

AC	R. A. + 0″.011	Decl. — 0″.021
AD	0.016	0.026

Therefore the proper motion of υ *Coronae* is:

0″.027 in 150°.1

The early measures by Sh have large errors in distance, and cannot be used in this connection.

From the star catalogues we have:

Auwers	0″.026	in	171°.4
Boss	0.028	in	158.1

7583. Σ 3103 *rej.* (8.8...9.7)

R. A. 16h 14m 24s Decl. — 3° 40′

1911.411	305°.2	24″.67
.414	304.4	24.36
.430	304.4	24.62
1911.42	304.7	24.55

7593. SD (3°) 3929. (7.6...8.7)

R. A. 16h 16m 14s Decl.— 3° 58′

A and B

1910.225	22°.39	101″.65
.244	22.15	101.77
.260	22.50	101.29
.263	22.40	101.55
1910.25	22.36	101.56
1911.411	22°.80	101″.96
.414	22.37	102.17
.430	22.30	101.79
.433	22.42	101.91
1911.42	22.47	101.96
1912.236	22°.18	102″.02
.255	22.40	102.02
.274	22.30	102.17
1912.25	22.29	102.07

There seems to be a proper motion in one of these stars of about 0″.17. The relative change is confirmed by the meridian positions in the A. G. Stras. and Warsaw Catalogues. To show whether or not the smaller component has any motion, I have connected a star 11.8m:

A and C

1910.260	340°.10	68″.46
.263	340.30	68.00
.299	340.18	68.20
1910.27	340.19	68.22
1911.414	340°.10	68″.52
.430	340.25	68.53
.433	340.45	68.54
1911.43	340.27	68.53

B and C

1910.260	243°.86	68″.85
.263	244.28	68.77
.299	244.45	69.35
1910.27	244.20	68.99
1911.414	244°.57	69″.19
.430	243.83	69.65
.433	244.22	68.83
1911.43	244.21	69.22

7596. γ *Herculis.* Sh 227. (3.5...9.5)

R. A. $16^h\ 16^m\ 38^s$ Decl. + 19° 26′

B and C (12.2)

1910.225	297°.60	84″.59
.260	297.33	84.94
.263	298.00	84.59
1910.25	297.64	84.71

It is very probable that B has no sensible proper motion; and that the value of the movement of A derived from the measures (1844-1903) is more nearly correct than that from meridian observations. For greater certainty I have connected a faint star with B.

Measures	0″.066	in	340°.3
Auwers	0.083	in	308.6
Rechenberg	0.080	in	305.3
Newcomb	0.060	in	307.5
Boss	0.062	in	309.0

7597. Ho 402. (8.5...12.0)

R. A. $16^h\ 16^m\ 47^s$ Decl. — 12° 52′

1910.452	230°.7	9″.47
.458	229.3	9.31
1910.45	230.0	9.39

Wrongly identified in Ho; the SD number is 4499 instead of 4497.

7612. 23 *Herculis.* (6.4...9.0)

R. A. $16^h\ 18^m\ 20^s$ Decl. + 32° 37′

1911.411	18°.60	34″.08
.430	18.08	34.13
.433	18.25	33.96
1911.42	18.31	34.06

The four positions by OΣ, Δ and β (1840-1911) give for the apparent motion of A:

0″.026 in 22°.1

OΣ calls the companion 8.5m; and Δ 9.0m. It is possible, though not probable, that this has some motion of its own.

The catalogues give for A:

Auwers	0″.020	in	146°.2
Boss	0.022	in	144.9
Newcomb	0.036	in	141.2

7624. ω *Herculis.* β 625. (5.0...12.0)

R. A. $16^h\ 19^m\ 53^s$ Decl. + 14° 19′

A and C (11.5)

1907.444	101°.2	31″.73
.463	101.7	32.11
.482	102.0	31.70
1907.46	101.6	31.85

The six positions of the distant companion (1879-1907) give for the proper motion of A:

0″.084 in 132°.6

From meridian observations:

Auwers	0″.065	in	159°.1
Boss	0.078	in	146.1

A later set of measures will not sensibly change the result given above:

1912.353	101°.0	31″.41
.389	100.8	31.53
.408	101.5	31.48
1912.38	101.1	31.47

7633. Σ 2048. (6.3...9.0)

R. A. $16^h\ 22^m\ 20^s$ Decl. — 7° 52′

A and C (11.7)

1910.263	299°.30	131″.78
.397	298.80	132.21
.414	299.37	132.07
1910.36	299.16	132.02

For the proper motion of AB.

Bossert	0″.114	in	195°.1
Porter	0.079	in	228.8

7640. β 815. (8.1...10.4)

R. A. $16^h 23^m 16^s$ Decl. + 43° 11′

A and B

1910.167	338°.8	10″.67
.184	338.7	10.50
.186	338.5	10.37
.203	337.8	10.39
1910.18	338.4	10.48

A and C (11.5)

1910.184	160°.72	67″.91
.203	160.15	68.05
.225	160.75	67.49
.244	160.32	66.90
1910.21	160.48	67.59

B and C

1910.184	160°.37	79″.00
.203	160.08	78.67
.225	159.97	78.07
.244	160.52	77.84
1910.21	160.24	78.39

The measures of C show that the proper motion is in B. From the measures to 1905, this motion is:

0″.143 in 323°.1

A and DM (43°) 2608

1825	Δ R. A. + $40^s.6$	Δ Decl. + 21″.8	Weisse
1875	40.0	24.0	A. G. Bonn
1910.2	40.0	23.1	β

7642. Σ 2052. (7.5...7.5)

R. A. $16^h 23^m 37^s$ Decl. + 18° 40′

A and C (11.6)

1911.468	26°.70	147″.60
.471	27.00	147.71
.487	26.83	147.15
1911.48	26.84	147.49

This pair seems to belong to the 61 *Cygni* class. Third star for an independent value of the proper motion of AB.

A. G. Ber.	0″.534	in	320°.0
Porter	0.528	in	319.7

7645. Σ 3104. (8.5...10.0)

R. A. $16^h 23^m 45^s$ Decl. — 14° 17′

A and C (9.1)

1912.487	78°.73	108″.58
.504	78.93	109.02
.526	78.75	108.81
1912.50	78.80	108.80

From a comparison of this with the prior measures, it is evident that one of these stars has a proper motion of 0″.081 in 306°.2 (± 180°).

7649. λ *Ophiuchi.* Σ 2055. (4.0...6.1)

R. A. $16^h 24^m 52^s$ Decl. + 2° 15′

AB and C (11.0)

1912.411	169°.80	118″.70
.427	169.93	119.04
.430	170.00	118.50
1912.42	169.91	118.75

Although half a dozen orbits have been worked out, the apparent ellipse, and therefore the real orbit, is as uncertain now as it was half a century ago, and it is likely to remain indeterminate for a still longer time.

The proper motion of the binary system is given:

Auwers	0″.097	in	215°.8
Boss (P. G. C.)	0.097	in	209.7

7668. 31 *Herculis.* β 816.

R. A. $16^h 27^m 0^s$ Decl. + 33° 46′

The 9.5 m star, DM (33°) 2741, should be in the field with 31 *Herculis*, and 3°.7 *p* and 1′.7 *s*. There is no star in or near this place now. The small star may be variable, but the explanation is more likely to be found in an error in the DM.

The proper motion of 31 *Herculis* is:

Auwers	0″.042	in	260°.3
Boss	0.039	in	235.9

7675. Σ 2065. (8.0...8.7)

R. A. $16^h 28^m 36^s$ Decl. + 40° 14′

A and B

1909.112	217°.0	30″.79
.164	216.7	30.98
.186	216.6	31.13
1909.15	216.8	30.97

The measures of Σ, Δ and β give an apparent motion for A of 0″.015 in 332°.2, but this change may be in either component. I have therefore connected a third star to settle the question of motion hereafter.

A and C (12.8)

1909.164	25°.40	79″.74
.186	25.95	79.65
1909.17	25.67	79.69

7682. Young. (8.0...9.5)

R. A. $16^h 29^m 26^s$ Decl. + 58° 1′

AB and Dreyer 6187

1910.280	180°.18	208″.8
.337	180.47	206.2
.395	179.80	206.2
1910.34	180.15	207.1

Nebula small, but ill-defined. Its place (1860) is therefore:

R. A. $16^h 29^m 1^s$ Decl. + 58° 0′ 16″

7699. β 820. (8.0...9.5)

R. A. $16^h 33^m 8^s$ Decl. — 2° 52′

A and C (12.9)

1911.219	257°.42	162″.70
.260	257.43	162.38
1911.24	257.42	162.54

For the proper motion of AB.

Radcliffe 0″.112 in 290°.9

7702. 16 *Draconis*. Σ 30, App. I. (5.0...5.0)

R. A. $16^h 33^m 21^s$ Decl. + 53° 8′

A and C (11.0)

1910.128	122°.20	118″.50
.148	122.65	118.91
.164	122.40	119.02
1910.15	122.42	118.81

The early measures are discordant in distance:

1879.56	122°.16	116″.41	1n	Bl
1880.21	122.32	117.39	1n	Bl.

The proper motions of the large stars are given:

A	Auwers	0″.029	in	336°.6
	Boss	0.025	in	324.2
B	Auwers	0.038	in	303.7
	Boss	0.022	in	335.8

Whatever this motion is, it is exactly the same for each star.

7708. Σ 2080. (8.0...11.8)

R. A. $16^h 34^m 26^s$ Decl. + 38° 34′

A and B

1910.337	24°.6	2″.72
.375	24.6	2.95
1910.36	24.6	2.83

The principal star has a small proper motion.

A and C (10.8)

1910.337	219°.74	109″.44
.356	219.62	109.79
.375	220.13	109.20
1910.36	219.83	109.48

A and DM (38°) 2811 (8.1)

1875	Δ R. A. $33^s.6$	Δ Decl. 61″.3	A. G. Lund
1910.2	33.4	63.6	β

7714. 42 *Herculis*. Σ 2082. (4.0...10.7)

R. A. $16^h 35^m 29^s$ Decl. + 49° 10′

1912.236	91°.5	24″.20
.274	91.7	24.12
.296	92.4	24.39
1912.27	91.9	24.24

The distance is slowly increasing. If the large star has the proper motion indicated by the meridian positions, this is a system of the 61 *Cygni* class. There is no third star available for measurement.

Auwers	0″.023	in	335°.0
Battermann	0.047	in	301.9
Boss	0.044	in	307.4

7726. β 953. (8.0...8.6)

R. A. $16^h 37^m 21^s$ Decl. + 70° 2′

AB and C (10.0)

1911.280	151°.8	72″.21
.302	152.4	72.21
1911.29	152.1	72.21

AB and O. Arg. N. 16458

1911.241	46°.80	146″.53
.260	46.90	146.86
.280	46.85	146.24
1911.26	46.85	146.54

For the distant star there are meridian positions:

1842	47°.6	145″.9	O. Arg. N.
1900	47.4	146.8	Greenwich
1905	47.0	147.3	A. G. Berlin.

7730. Σ 2087. (8.2...8.2)

R. A. $16^h 37^m 33^s$ Decl. + 23° 54′

A and C (11.5)

1911.299	354°.18	121″.32
.302	353.65	121.16
.334	353.77	121.65
1911.31	353.87	121.38

h 1970 is about $1^m 50^s$ *f;* measures of this are given here as No. 7745.

The proper motions of the Σ components are given in A. G. Berlin:

A	0″.079	in	300°.3
B	0.100	in	287.3

As these stars are relatively fixed, the motions must be the same.

7733. Σ 2086.

R. A. $16^h 38^m 8^s$ Decl. — 0° 20′

The wide pair measured by Glasenapp (see *General Catalogue*) is 25°.0 *p* and 93″.2 *n* of Σ 2086.

A and B (9.3...9.5)

1911.184	300°.58	102″.22
.200	300.68	101.94
.219	300.35	102.14
1911.20	300.54	102.10

A and *a* (11.0)

1911.184	141°.2	2″.29
.200	146.1	2.49
1911.19	143.6	2.39

The near companion not previously seen.

7735. OΣ (App.) 149. (6.7...7.3)

R. A. $16^h\ 38^m\ 19^s$ Decl. $+20°\ 57'$

1911.280	135°.23	98″.73
.299	135.25	98.88
.302	135.04	99.38
1911.29	135.17	99.00

Relatively fixed.

7738. η *Herculis.*

R. A. $16^h\ 38^m\ 47^s$ Decl. $+39°\ 9'$

1911.241	262°.60	113″.70
.258	262.28	113.90
.260	262.40	113.61
.280	262.30	113.83
1911.26	262.39	113.76

The later measures compared with my single night in 1879 give for the proper motion of η *Herculis:*

Measures	0″.090	in	157°.0
Auwers	0.079	in	161.2
Boss	0.101	in	160.4
Newcomb	0.100	in	159.3

7740. 41 *Herculis.* (6.2...9.0)

R. A. $16^h\ 39^m\ 9^s$ Decl. $+6°\ 19'$

A and B

1907.217	191°.2	162″.53
.258	191.2	163.15
.291	191.4	162.83
1907.26	191.3	162.84

A and C (9.5)

1907.217	246°.4	159″.06
.258	246.3	159.50
.291	246.5	159.20
1907.26	246.4	159.25
1911.241	246°.28	158″.09
.260	246.47	158.20
.280	246.18	157.77
.302	246.18	157.83
1911.27	246.28	157.97

From all the measures of AC by OΣ and β (1854-1911) the proper motion of 41 *Herculis* is:

0″.343 in 222°.5

B and *a* (12.5)

1907.197	348°.3	62″.90
.217	346.6	62.83
.258	347.8	63.50
1907.22	347.6	63.08

C and *a*

1907.197	108°.6	106″.37
.217	107.6	106.45
.258	108.5	105.76
1907.22	108.2	106.19
1911.241	108°.30	105″.94
.260	107.83	105.61
.302	107.92	105.74
1911.27	108.02	105.76

The measures of C are continued for a more accurate proper motion of 41 *Herculis.* The positions of the faint star show that C has no motion.

Auwers	0″.336	in	233°.4
Porter	0.341	in	224.8
Boss	0.352	in	218.2

7745. A. G. 205.

R. A. $16^h\ 39^m\ 28^s$ Decl. $+24°\ 1'$

This is the planetary nebula *h* 1970 (Dreyer 6210). In the course of my measures of all the well-known planetary nebulae in 1891 at the Lick Observatory, this was examined with others as stated in the introductory remarks (Publ. L. O. II, p. 159); but for some reason, which I am unable to explain at this time, the central star, which is characteristic of all nebulae of this class, was not seen. At the present time it could not be overlooked with any moderate aperture. It is nearly twelfth magnitude, and appears with favorable atmospheric conditions as a sharp, brilliant point. Doubtless this has been seen by others. If it is not variable, I cannot account for my failure to see and measure it with the 36-inch at Mt. Hamilton.

It is now connected by measures with the nearest comparison star.

h 1970 and star (12.3...11.3)

1908.156	271°.73	123″.19
.249	271.85	123.64
.266	271.92	123.77
9.167	272.17	124.64
.227	271.65	123.84
.304	272.20	124.17
1908.72	271.92	123.87

7747. 43 *Herculis.* Sh 239. (5.5...9.0)

R. A. $16^h\ 40^m\ 4^s$ Decl. $+8°\ 48'$

A and B

1911.353	230°.23	82″.43
.356	229.70	82.44
.373	229.80	82.24
1911.36	229.91	82.37

From meridian observations the amount and direction of the proper motion of 43 *Herculis* is somewhat uncertain:

Auwers	0″.050	in	335°.7
Boss	0.016	in	354.7

The four positions by OΣ, Δ and β (1852-1911) give:

0″.015 in 340°.8

It is safe to assume that the 9 m star has no motion which would affect this result, but I have connected with it a very small star:

B and C (12.0)

1911.356	133°.13	98″.57
.375	133.23	98.47
.392	133.70	98.65
1911.37	133.35	98.56

7752. Σ 2100 *rej.* (8.5...10.7)

R. A. 16ʰ 40ᵐ 38ˢ Decl. + 50° 53′

1907.331	295°.0	23″.36
8.156	298.2	23.63
8.192	295.3	23.60
1907.89	296.2	23.53

The only other measures are given in the *General Catalogue.*

7756. Espin 76. (9.7...9.9)

R. A. 16ʰ 40ᵐ 58ˢ Decl. + 50° 50′

1907.351	44°.0	2″.77
8.425	44.0	1.97
8.444	46.6	2.40
1908.07	44.9	2.38

7757. Σ 2098. (8.0...9.0)

R. A. 16ʰ 41ᵐ 2ˢ Decl. + 30° 14′

A and C (9.5)

1909.400	136°.18	64″.74
10.148	135.12	64.08
10.167	134.40	64.69
1909.90	135.23	64.50

A and D (8.0)

1909.400	16°.05	61″.57
10.148	15.32	61.66
10.167	15.30	61.62
1909.90	15.56	61.62

The position of AC by Σ is evidently only a rough setting. The meridian observations give:

1875	136°.7	64″.76	A. G. Leid.

The other distant star has a very faint attendant:

D and *d* (14.0)

1910.184	272°.5	5″.65
.203	269.9	5.51
1910.19	271.2	5.58

7758. 19 *Ophiuchi.* Σ 2096. (6.0...9.3)

R. A. 16ʰ 41ᵐ 7ˢ Decl. + 2° 17′

A and B

1911.373	90°.40	22″.76
.392	90.37	22.72
.395	90.26	22.72
1911.39	90.34	22.73

These stars appear to have a small common proper motion.

Auwers	0″.046	in	251°.5
Boss	0.037	in	238.9

I have therefore measured a third star.

A and C (11.3)

1911.356	194°.20	213″.19
.373	194.15	213.46
.392	194.47	213.71
1911.37	194.27	213.45

7768. Σ 2103. (5.2...10.0)

R. A. 16ʰ 44ᵐ 2ˢ Decl. + 13° 28′

A and B

1911.468	41°.0	5″.26
.471	40.3	5.23
.487	42.6	5.28
1911.48	41.3	5.26

Measures by Σ, Δ, Sp and β on 14 n (1830-1911) give for the apparent proper motion of A:

Measures	0″.008	in	350°.2
Boss	0.037	in	221.4

It is not likely that B has any motion which would change this result, but for greater certainty I have connected two very faint stars:

A and C (13.6)

1911.468	246°.1	17″.98
.471	244.8	17.98
.487	244.7	18.23
1911.48	245.2	18.06

A and D (12.8)

1911.468	140°.9	40″.27
.471	141.8	40.53
.487	141.8	40.72
1911.48	141.5	40.51

7770. A. G. 206. (9.3...9.7)

R. A. 16ʰ 44ᵐ 35ˢ Decl. + 67° 0′

1907.331	155°.5	5″.66
.351	155.1	5.69
1907.34	155.3	5.67

By an error of the printer, the position-angle by Doolittle of 154°.7 is printed 164°.7 in the *General Catalogue.*

7775. Schj 13. (8.0...12.6)

R. A. $16^h 45^m 8^s$ Decl. + 4° 59′

A and B

1911.392	56°.27	122″.46
.395	55.93	122.13
.411	56.00	121.65
1911.40	56.07	122.08

No other measures of the distant star. The other has some motion:

Bossert	0″.143	in	155°.3
Porter	0.110	in	155.9

7779. 52 *Herculis.* β 627. (5.0...10.5)

R. A. $16^h 45^m 43^s$ Decl. + 46° 12′

A and D (12.0)

1911.142	230°.20	66″.02
.164	230.17	66.35
.184	230.63	66.10
1911.16	230.33	66.16

A and E (12.0)

1911.142	268°.70	145″.29
.164	268.57	145.91
.184	268.65	145.81
1911.16	268.64	145.67

The measures of the two small stars give for the proper motion of 52 *Herculis:*

0″.094 in 144°.4

Some of the values from meridian positions are:

Auwers	0″.073	in	210°.7
Boss	0.076	in	163.4
Groombridge	0.059	in	147.3

Aitkin finds the 10.5 m companion to 52 *Herculis* a close pair, 311° : 0″.25.

7780. Σ 2108 *rej.* (8.4...10.3)

R. A. $16^h 46^m 4^s$ Decl. + 55° 21′

1907.331	352°.1	26″.76
7.351	352.1	26.67
8.192	351.9	26.59
1907.62	352.0	26.67

No early measures.

7800. OΣ 317. (7.2...11.8)

R. A. $16^h 49^m 19^s$ Decl. + 44° 36′

A and B

1907.331	219°.8	18″.13
.351	219.1	18.20
.463	220.1	18.25
1907.38	219.7	18.19

A and C (8.0)

1907.331	317°.80	117″.12
.351	317.42	117.65
.463	317.90	117.26
1907.38	317.71	117.34

From six sets of measures of AB (1846-1907) the apparent motion of B is:

0″.083 in 162°.5

From six sets of measures of AC (1874-1907) the apparent motion of C is:

0″.119 in 298°.8

At least two of these stars have a considerable proper motion.

7830. Σ 32, App. I. (7.0...7.1)

R. A. $16^h 54^m 34^s$ Decl. + 47° 32′

1909.112	262°.67	113″.39
.148	262.57	113.59
.151	262.80	113.57
1909.14	262.68	113.52

From the measures by Σ, Δ and β, one of these large stars should have a proper motion of

0″.024 in 135°.0 (± 180°)

I do not find any motion given in the star catalogues.

A and *a* (11.2)

1909.112	51°.6	2″.94
.167	51.8	2.92
1909.14	51.7	2.93

The small companion to A was detected by Aitken.

7845. 34 *Ophiuchi.* Σ 33, App. I. (5.8...6.3)

R. A. $16^h 58^m 7^s$ Decl. + 13° 47′

B and *a* (10.0)

1909.148	267°.50	151″.52
.151	267.63	151.75
.167	267.77	151.59
1909.16	267.63	151.62

a and *b* (10.5)

1909.167	209°.57	98″.64
.227	209.28	98.38
.304	209.27	98.50
1909.23	209.37	98.51

The only other measures are:

1887.52	266°.55	151″.44	2n	Eng
1894.69	267.03	152.11	2n	Eng.

From the three positions the proper motion of 34 *Ophiuchi* is:

Measures	0″.124	in	178°.7
Porter	0.134	in	199.4
Boss	0.136	in	173.8
Auwers	0.134	in	185.6

The measures of the small stars should be continued.

7855. 60 *Herculis.* H V. 133. (5.0...11.0)

R. A. 16^h 59^m 49^s Decl. + 12° 54′

1911.162	309°.30	55″.05
.184	309.20	54.88
.200	309.02	55.10
.219	309.22	55.15
1911.19	309.18	55.04

The proper motion of 60 *Herculis* from the measures (1852-1903) is:

Measures	0″.061	in	105°.4
Auwers	0.032	in	93.6
Boss	0.055	in	107.9

7858. *Herculis* 210. Σ 2120. (6.4...9.2)

R. A. 17^h 0^m 0^s Decl. + 28° 15′

A and B

1907.331	241°.4	8″.68
.348	242.4	8.79
.351	241.4	8.70
1907.34	241.7	8.72

A and C (9.6)

1907.331	174°.15	145″.04
.348	174.32	145.69
.351	174.22	145.66
1907.34	174.23	145.46

A and A. G. Camb. 8000

1907.331 Δ Decl. = 15″.40

The distant star is measured for determining hereafter how much, if any, of the proper motion is in the small star B.

The measures give for the proper motion of A:

0″.146 in 47°.0

7863. β 823. (8.2...9.2)

R. A. 17^h 0^m 29^s Decl. + 0° 49′

In Part I of the *General Catalogue* the declination of this star is erroneously printed — 0° 49′.

AB and DM (0°) 3634 (9.5)

1912.545	85°.60	171″.59
.562	85.65	171.55
.564	85.45	171.69
1912.56	85.57	171.61

The only other position from the star catalogues is:

1859	84°.7	172″.5	Hd Zones

7864. H 2804. (9.8...10.1)

R. A. 17^h 0^m 31^s Decl. + 39° 9′

1907.331	276°.4	14″.74
8.370	277.1	14.41
8.422	277.1	14.57
1908.04	276.9	14.57

There seems to be no doubt of change in angle and distance. The components are not given in DM.

7872. Σ 2128. (8.0...9.2)

R. A. 17^h 1^m 43^s Decl. + 59° 44′

1907.331	50°.0	11″.91
7.351	49.9	11.84
8.370	51.2	11.91
1907.68	50.4	11.89

Very little relative motion. Appears to be a pair of the 61 *Cygni* class. The proper motion of the larger star is given:

Porter	0″.466	in	301°.6
Kustner	0.442	in	302.1

A third star should be connected.

7873. OΣ 323. (7.4...10.5)

R. A. 17^h 1^m 44^s Decl. + 47° 8′

1911.375	93°.2	8″.53
.392	93.1	8.36
.430	93.5	8.53
1911.40	93.3	8.47

The change is due to the motion of A. From measures by OΣ, Δ, Doo, Hu and β on 19n (1848-1911) the proper motion of the large star is:

0″.046 in 223°.7

7875. A. G. 208. (9.0...9.2)

R. A. 17^h 2^m 8^s Decl. + 1° 53′

1912.465	244°.0	26″.00
.504	243.6	26.14
.507	244.4	25.94
1912.49	244.0	26.03

One of these stars has a small proper motion of at least 0″.2. Should be connected with a third star.

7876. Σ 2127 *rej.* (8.2...10.5)

R. A. 17^h 2^m 30^s Decl. + 31° 15′

1907.217	275°.1	16″.21
.233	277.1	16.11
.331	274.9	16.52
1907.26	275.7	16.28

The only other measures disagree in angle and distance.

7882. H 264. (9...11)

R. A. 17h 3m 26s Decl. + 36° 6′

1907.233	201°.3	14″.14
.331	201.6	13.80
.348	201.5	13.78
1907.30	201.5	13.91

A and 5½ m star (= Ho 412)

1907.331	99°.9	245″.76

The small star in the field *sf,* DM (36°) 2828, has a small companion; magnitudes 9.5 and 13.5; not given in the *General Catalogue:*

1907.217	184°.1	6″.09
.331	185.5	6.97
.348	184.8	6.67
1907.30	184.8	6.58

DM (36°) 2828 and 2830

1907.233	54°.8	143″.33
.331	54.7	143.01
1907.28	54.7	143.17

7885. η *Ophiuchi.* β 1118. (3.4...3.9)

R. A. 17h 3m 30s Decl. — 15° 34′

AB and C (13.0)

1911.414	143°.23	94″.75
.449	142.70	94.75
.468	143.17	94.16
1911.44	143.03	94.55

AB and D (11.5)

1911.414	287°.68	99″.68
.449	288.03	99.76
.468	287.55	99.85
1911.44	287.75	99.76

Comparing these positions with the measures of 1898, we have an independent value of the proper motion of the large star, but the time interval is too short for a final correction:

AC	R. A. + 0″.006	Decl. + 0″.102
AD	0.034	0.119

Hence the motion of η *Ophiuchi* is:

0″.112 in 10°.3

Other values from meridian positions are:

Auwers	0″.097	in	2°.6
Boss	0.093	in	22.8
Newcomb (Stand.)	0.080	in	12.4
Newcomb (F. C.)	0.095	in	15.3

7893. Σ 2131. (7.5...8.5)

R. A. 17h 5m 6s Decl. + 30° 30′

1908.288	179°.1	24″.38
.331	178.5	24.30
.370	178.9	24.29
1908.33	178.8	24.32

No change in angle or distance since 1830.

7894. Espin 77. (6.5...11.2)

R. A. 17h 5m 20s Decl. + 51° 0′

1911.356	272°.5	17″.06
.373	273.5	16.85
.375	273.2	17.08
1911.37	273.1	17.00

Proper motion?

A. G. Camb.	0″.012	in	360°.0
Battermann	0.024	in	311.8

7898. Σ 2135. (7.1...8.4)

R. A. 17h 6m 58s Decl. + 21° 22′

A and B

1911.449	178°.6	7″.39
.468	179.6	7.28
.471	178.1	7.27
1911.46	178.8	7.31

One of these stars has a small proper motion. I have therefore connected a third star.

A and C (11.8)

1911.449	208°.05	159″.00
.468	207.77	159.12
.471	208.20	158.63
1911.46	208.01	158.92

7903. Σ 2138. (8.0...8.3)

R. A. 17h 7m 40s Decl. + 54° 39′

1909.167	136°.4	22″.25
.170	135.8	22.23
.186	136.0	22.39
.266	136.9	22.31
1909.20	136.3	22.29

No relative motion since 1830.

7914. α *Herculis.* Σ 2140. (3.0...6.1)

R. A. 17h 9m 10s Decl. + 14° 32′

A and D (10.6)

1912.427	39°.33	83″.79
.465	38.81	83.70
.485	38.77	83.77
.487	39.02	83.49
1912.47	38.98	83.69

For the proper motion of α *Herculis* we have:

Auwers	0″.049	in	326°.1
Newcomb	0.032	in	337.8
Boss	0.029	in	336.7

From the three measures of AD (1890-1912) on 10 n, the motion of the large star is:

0″.056 in 39°.2

It is very improbable that D has any sensible motion. This will be confirmed later by measures of AC.

7925. Σ 2146. (8.0...10.0)

R. A. 17ʰ 10ᵐ 27ˢ Decl. + 54° 16′

A and DM (54°) 1869 (8.9)

1909.151	51°.13	89″.00
.167	51.24	88.73
.170	50.97	88.78
1909.16	51.11	88.84

Third star measured for proper motion of AB if any. For this, further observations with the micrometer are necessary.

A. G. Harv. 0″.135 in 333°.8

From meridian positions we have:

1842	51°.2	91″.8	O. Arg. N.
1875	50.3	90.0	A. G. Harv.

7926. U *Ophiuchi.* H 854.

R. A. 17ʰ 10ᵐ 27ˢ Decl. + 1° 21′

1912.427	357°.7	20″.29
.430	357.0	20.64
.465	357.5	20.78
1912.44	357.4	20.57

Variable 6.0 to 6.7 m in about 20ʰ. The change, if any in the position of the faint star, is small.

7940. OΣ 326. (7.2...11.5)

R. A. 17ʰ 12ᵐ 34ˢ Decl. + 9° 39′

1911.414	213°.2	16″.02
.430	212.7	16.09
.433	212.8	16.16
1911.43	212.9	16.09

Comparing this position with those of OΣ and Hu, we have for the proper motion of A:

0″.046 in 102°.2

7942. Σ 2147. (7.1...11.0)

R. A. 17ʰ 12ᵐ 53ˢ Decl. + 29° 2′

1908.288	93°.1	6″.22
.331	91.8	6.16
.370	93.7	6.25
1908.33	92.9	6.21

Unchanged.

7948. S 686. (7.9...8.1)

R. A. 17ʰ 13ᵐ 17ˢ Decl. + 28° 52′

1911.430	4°.20	52″.87
.433	4.25	52.61
.449	4.40	52.73
1911.44	4.28	52.74

One of these stars has a small proper motion. The four positions by S, Cin and β (1825-1911) give for the apparent motion of A:

0″.026 in 10°.9

A third star should be connected with one of the components.

7962. Σ 2155. (6.2...9.5)

R. A. 17ʰ 14ᵐ 37ˢ Decl. + 60° 50′

1911.375	114°.1	9″.91
.392	113.2	9.91
.395	113.3	9.86
1911.39	113.5	9.89

The proper motion of A from meridian observations is uncertain:

Kustner	0″.031	in	315°.1
Greenwich	0.035	in	4.8

The measures of the 9.5 m star imply a much smaller motion of about 0″.006 in 260°.

7968. Σ 2150. (9.3...10.2)

R. A. 17ʰ 15ᵐ 10ˢ Decl. + 1° 41′

A and B

1912.427	200°.7	9″.10
.430	200.3	9.21
.465	200.7	9.31
1912.44	200.6	9.21

One of these stars, presumably the larger, has a small proper motion.

A and DM (1°) 3422

1912.427	57°.34	163″.58
.430	57.60	163.41
.465	57.41	163.89
1912.44	57.45	163.63

The only other measure of this is given in Part II of the *General Catalogue.*

7972. 70 *Herculis.* S 687. (5.5...9.0)

R. A. 17ʰ 15ᵐ 58ˢ Decl. + 24° 37′

A and B

1911.430	56°.18	220″.98
.433	56.15	220.58
.449	56.35	220.68
1911.44	56.23	220.75

B is DM (24°) 3168. The proper motion of 70 *Herculis* is small, and somewhat uncertain:

Auwers	0″.037	in	282°.3
Boss	0.018	in	266.8

As B appears to share the motion of A, whatever it is, I have connected with it a faint star.

B and C (12.2)

1911.433	314°.95	146″.49
.449	314.90	146.97
1911.44	314.92	146.73

7976. 72 *Herculis.* (5.5...)

R. A. $17^h 16^m 10^s$ Decl. + 32° 38′

B and C (12.5)

1911.184	214°.3	8″.79
.200	215.1	8.99
.219	217.9	8.52
1911.20	215.8	8.77

A and B (9.6)

1911.162	333°.95	217″.78
.164	334.10	217.53
.184	333.75	217.59
1911.17	333.93	217.63

From the seven positions of AB (1853-1911) we have for the proper motion of 72 *Herculis:*

1″.019 in 171°.2

From the catalogues:

Auwers	1″.030	in	174°.4
Boss	1.060	in	173.2
Newcomb	1.054	in	173.7

8003. *ρ Herculis.* Σ 2161. (4.0...5.1)

R. A. $17^h 19^m 33^s$ Decl. + 37° 15′

A and C (12.8)

1911.222	223°.07	119″.99
.260	223.43	119.11
.299	223.45	119.28
1911.26	223.32	119.46

For the proper motion of AB. No other measures.

Auwers	0″.074	in	282°.4
Boss	0.038	in	264.0
Newcomb	0.035	in	261.3

8015. Σ 2167 *rej.* (8.1...10.7)

R. A $17^h 21^m 21^s$ Decl. + 49° 38′

1907.351	222°.8	18″.24
8.422	223.1	18.56
8.425	223.0	18.67
1908.07	223.0	18.49

No early measures of this pair.

8017. Σ 2165. (7.0...8.5)

R. A. $17^h 21^m 35^s$ Decl. + 29° 34′

A and C (10.2)

1909.340	251°.55	96″.66
.342	251.62	96.54
.378	251.82	96.96
1909.35	251.66	96.72

C and *c* (11.1)

1909.342	179°.58	48″.72
.378	179.10	48.78
1909.36	179.34	48.75

The only other measures of C, which are given in the *General Catalogue,* indicate some proper motion in AB.

8032. Σ 2169. (8.0...10.0)

R. A. $17^h 23^m 28^s$ Decl. — 8° 19′

1908.252	97°.6	14″.79
.556	97.8	15.06
.559	98.9	14.93
1908.46	98.1	14.93

Change in angle; probably a small proper motion in A.

8062. β *Draconis.* β 1090. (3.0...14.0)

R. A. $17^h 27^m 43^s$ Decl. + 52° 23′

A and C (12.7)

1912.351	156°.58	115″.40
.389	156.70	115.75
.411	156.43	115.77
1912.38	156.57	115.64

No other measures. The proper motion of β *Draconis* is small and not very certain in amount:

Auwers	0″.020	in	290°.9
Groombridge	0.017	in	298.7
Newcomb (Stand.)	0.011	in	266.4
Boss	0.015	in	297.0

8065. 54 *Ophiuchi.* Σ 2184. (6.3...11.2)

R. A. $17^h 28^m 51^s$ Decl. + 13° 15′

1912.351	71°.8	21″.85
.389	71.5	21.94
.408	71.1	21.68
1912.38	71.5	21.82

There appears to be a slow decrease in the angle, the distance remaining constant. The proper motion of 54 *Ophiuchi* is uncertain in amount and direction.

Auwers	0″.070	in	224°.8
Boss	0.036	in	173.1

8067. 53 *Ophiuchi.* Σ 34, App. I. (5.6...7.3)

R. A. $17^h\ 28^m\ 55^s$ Decl. + 9° 40′

A and B

1912.542	190°.60	41″.27
.545	190.80	41.18
.562	190.90	41.40
1912.55	190.77	41.28

No material change since 1835. The proper motion of 53 *Ophiuchi* is uncertain, and I have, therefore, connected two small stars.

A and C (10.6)

1912.526	344°.70	93″.95

B and D (10.6)

1912.526	223°.35	91″.40

Auwers	0″.061	in	255°.8
Boss	0.017	in	210.6

8068. Σ 2185. (7.0...10.0)

R. A. $17^h\ 28^m\ 56^s$ Decl. + 6° 6′

A and C (7.7)

1909.455	207°.70	83″.65
.496	207.60	83.75
.512	207.58	84.10
1909.49	207.63	83.83

For an independent determination of the motion of C, I have connected a 10.5 m star:

C and D

1909.455	182°.30	140″.73
.496	182.13	140.68
.512	182.43	140.60
1909.49	182.29	140.67

A and B have a common proper motion:

Porter	0″.070	in	210°.8
Furner	0.062	in	216.3

C has a much larger motion:

Porter	0″.578	in	309°.3
Glasgow	0.617	in	306.0
Furner	0.632	in	304.7

8076. ν^1, ν^2 *Draconis.* Σ 35, App. I. (4.6...4.6)

R. A. $17^h\ 29^m\ 48^s$ Decl. + 55° 16′

1910.397	311°.88	61″.49
.414	312.26	62.02
.416	312.00	62.09
.436	312.35	61.47
1910.42	312.12	61.77

No change since 1833. Common proper motion. This is given from meridian observations:

A (ν^2)	Auwers	0″.159	in	71°.3
	Boss	0.165	in	72.0
B (ν^1)	Auwers	0.153	in	70.9
	Boss	0.158	in	72.0

8093. Sh 251. (6.5...8.5)

R. A. $17^h\ 33^m\ 5^s$ Decl. + 2° 6′

A and C (10.4)

1912.526	17°.57	132″.50
.542	17.58	132.46
.545	17.27	132.26
1912.53	17.47	132.41

The proper motion of the principal star is:

Boss	0″.047	in	112°.5

As there has been no change in AB, this is the movement of the other component. This will be more accurately found hereafter from further measures of the faint star.

8099. 26 *Draconis.* β 962. (5.5...10.1)

R. A. $17^h\ 33^m\ 45^s$ Decl. + 61° 58′

1908.518	351°.5	1″.06
.575	353.0	1.21
.597	348.5	1.16
1908.56	351.0	1.14
1910.164	352°.5	1″.21
.184	350.5	1.13
.452	350.3	1.39
.471	352.4	1.19
.473	346.8	1.29
1910.34	350.5	1.24

The elements of the orbit are as uncertain now as they were twenty years ago, although the described arc is 157°.

The proper motion of the binary system is:

A. G. Hels.	0″.583	in	152°.7
Groombridge	0.563	in	155.4
Porter	0.569	in	154.2
Boss	0.563	in	154.5

8114. Σ 2194. (6.2...8.5)

R. A. $17^h\ 36^m\ 10^s$ Decl. + 24° 34′

A and DM (24°) 3226 (9.0)

1909.266	161°.42	163″.98
.304	161.20	164.28
.340	161.28	163.88
1909.30	161.30	164.05

From meridian positions:

1880.4	161°.3	162″.9	A. G. Ber.

A and B appear to have the same proper motion.

A. G. Ber.	0″.056	in	345°.8
Boss	0.052	in	340.1

8120. β 1251. (6.0...11.5)

R. A. 17ʰ 36ᵐ 35ˢ Decl. + 16° 1′

A and C (12.8)

1910.280	276°.25	154″.86
.375	276.30	154.90
.414	276.57	155.45
1910.36	276.37	155.07

For the proper motion of A. This from meridian observations is:

A. G. Ber.	0″.121	in	350°.4
Porter	0.115	in	360.0
Boss	0.096	in	358.3

8123. A. G. 212. (9.5...9.5)

R. A. 17ʰ 36ᵐ 47ˢ Decl. + 5° 23′

1907.331	27°.3	2″.28
.351	26.0	2.28
1907.34	26.6	2.28

8135. Schj 15. (7.1...8.2)

R. A. 17ʰ 38ᵐ 28ˢ Decl. — 1° 41′

A and C (9.5)

1910.375	147°.50	139″.31
.414	147.83	139.43
.436	147.75	139.37
1910.41	147.69	139.37

The only other measures are given in Part II of the *General Catalogue.*

8136. 61 *Ophiuchi.* Σ 2202. (5.5...5.8)

R. A. 17ʰ 38ᵐ 33ˢ Decl. + 2° 38′

A and B

1912.526	92°.75	20″.37
.542	93.30	20.56
.545	93.43	20.50
1912.53	93.16	20.48

B and C (12.5)

1912.542	28°.60	96″.03
.545	27.93	95.78
1912.54	28.26	95.90

The proper motion of A is given:

Auwers	0″.018	in	334°.9
Boss	0.014	in	347.9

As there has been no change in B for 90 years, the proper motion must be exactly the same. The meridian positions give for B:

Boss	0″.015	in	23°.2

8142. H 4977. (7.6...9.5)

R. A. 17ʰ 39ᵐ 16ˢ Decl. — 3° 27′

AB and C (13.7)

1910.280	143°.1	21″.76
.375	144.4	21.75
.414	142.1	21.85
1910.36	143.2	21.79

No other measures of the Herschel companion.

8155. Σ 2211. (8.2...9.2)

R. A. 17ʰ 40ᵐ 27ˢ Decl. — 1° 10′

A and B

1910.280	114°.9	10″.25
.375	115.0	10.21
.414	115.3	10.24
1910.36	115.1	10.23

A and C (9.2)

1910.280	197°.82	105″.52
.375	197.80	105.23
.414	197.83	105.50
1910.36	197.82	105.42

The only other measure of C is given in the *General Catalogue.*

8169. H 2810. (7.3...9.8)

R. A. 17ʰ 42ᵐ 28ˢ Decl. — 19° 58′

1909.513	190°.1	40″.92
.515	189.7	40.90
.531	189.8	40.77
1909.52	189.9	40.86

H 2810 and *h* 1986

1909.513	270°.4	297″.1
.531	270.3	297.0
1909.52	270.3	297.0

h 1986 and star 10.7 m

1909.513	301°.7	32″.67

The star is measured from the nucleus on the *np* side of *h* 1986. The following is the relation of the two condensations:

1909.513	147°.7	30″.44

In the *General Catalogue* the nebula is erroneously called *h* 4333; that is the number in Herschel's *General Catalogue of Nebulae.*

8182. ψ *Draconis.* Σ 2241. (4.0...5.2)

R. A. 17ʰ 44ᵐ 5ˢ Decl. + 72° 13′

A and B

1908.370	15°.45	30″.54
.383	15.88	30.50
.403	15.43	30.55
1908.39	15.59	30.53

A and C (10.5)

1908.252	121°.60	92″.46
.288	122.00	92.28
.331	121.27	92.02
.370	122.00	92.55
1908.31	121.72	92.33

The proper motion of A as deduced from the five measures (1857-1908) of the small star C should be more accurate than that from any other data:

0″.283 in 176°.15

Some of the former results from meridian positions are:

Newcomb	0″.268	in	178°.4
Greenwich	0.279	in	177.8
Boss	0.267	in	176.9

I have measured a small star from C. When these stars are remeasured hereafter, it is practically certain that there will be no change.

C and D (12.0)

1908.370	19°.13	67″.37
.383	19.05	67.45
.403	18.75	67.93
1908.39	18.98	67.58

8187. Σ 2230. (8.2...8.7)

R. A. $17^h 44^m 54^s$ Decl. + 7° 57′

A and B

1909.304	84°.38	45″.51
.378	84.88	45.57
.512	84.67	45.42
1909.40	84.64	45.50

A and C (10.5)

1909.304	109°.60	37″.70
.378	109.85	37.43
.512	109.63	37.66
1909.40	109.69	37.60

The four positions by Σ, Δ and β (1831-1909) of these stars give for the proper motion of A:

AB	R. A. — 0″.016	Decl. + 0″.016
AC	0.009	0.024
	— 0.012	+ 0.020

Therefore the proper motion of the principal star is:

0″.023 in 329°.0

8197. Σ 2233. (7.5...10.3)

R. A. $17^h 45^m 52^s$ Decl. + 2° 56′

A and C (13.6)

1907.597	141°.1	22″.54
8.331	140.3	22.79
8.482	141.3	22.81
1908.14	140.9	22.71

A and D (13.2)

1907.597	236°.0	30″.20
8.331	235.2	30.83
8.482	236.3	30.53
1908.14	235.8	30.52

The only other measures are by Lewis in 1905.

8209. Σ 3128. (7.0...10.5)

R. A. $17^h 46^m 28^s$ Decl. — 7° 53′

A and C (12.8)

1911.449	101°.90	92″.37
.468	101.40	93.02
.471	102.40	92.28
.509	101.87	93.08
1911.47	101.89	92.69

For the proper motion of AB. No material change in the close pair.

Paris	0″.218	in	180°.0
Porter	0.234	in	190.2

8211. Σ 2235. (7.5...9.1)

R. A. $17^h 46^m 44^s$ Decl. — 2° 14′

1908.249	124°.0	19″.38
.252	123.7	19.33
.266	123.3	19.46
1908.26	123.7	19.39

Perhaps a little increase in distance.

8223. H 1307. (7.0...11.0)

R. A. $17^h 47^m 45^s$ Decl. + 27° 13′

1910.225	323°.4	33″.60
.260	322.9	33.15
.337	323.2	33.68
1910.27	323.2	33.48

Change in distance is probable.

8224. OΣ (App.) 160. (8.2...8.6)

R. A. $17^h 47^m 46^s$ Decl. + 10° 59′

1910.263	191°.45	102″.15
.280	191.35	102.23
.337	191.30	101.94
1910.29	191.37	102.11

Further measures are necessary to confirm the apparent change. The meridian positions are uncertain in distance:

1875	191°.6	101″.3	A. G. Leip.
1880	191.4	105.8	Munich

8245. Ho 72. (9.0...11.5)

R. A. $17^h\ 51^m\ 27^s$ Decl. + 33° 27′

A and B

1907.197	2°7	8″34
.217	2.3	8.53
.329	3.7	8.57
1908.252	2.2	8.67
.288	3.4	8.82
.370	1.9	8.98
.383	3.2	9.10
.444	2.3	9.16
1909.304	2.0	9.12
.342	2.8	8.85
.378	3.4	9.03
.438	2.5	9.06
1910.225	1.5	9.19
.337	2.1	9.39
.395	2.4	9.25
1911.241	2.5	9.54
.299	1.5	9.58
.337	3.0	9.60
.375	3.0	9.34

The several mean results of the above measures are:

1907.25	2°9	8″48	3n
1908.35	2.6	8.95	5n
1909.37	2.7	9.02	4n
1910.32	2.0	9.28	3n
1911.31	2.5	9.51	4n

From positions by Ho (2), Doo (2) and β (7), making altogether measures on 43 n, we have for the proper motion of B:

0″250 in 359°7

A and C

1907.351	36°4	9″05
1910.337	37°7	9″39
.397	38.9	9.01
.452	36.9	9.50
1910.40	37.8	9.30
1911.337	38°3	9″15
.411	36.4	9.07
.471	37.0	9.40
1911.41	37.2	9.21

No change in C.

B and C

1910.337	107°1	5″51
.397	105.1	5.48
.454	107.4	5.69
1910.40	106.5	5.56

As a further check on this extraordinary motion of a very small star, I have connected with it one still fainter.

B and D (12.0)

1911.487	56°32	134″13
.509	56.68	134.19
.526	56.48	134.15
1911.51	56.49	134.16

8247. Σ 2251. (8.2...11.2)

R. A. $17^h\ 51^m\ 32^s$ Decl. + 49° 39′

1909.266	27°0	15″10
.302	28.1	15.22
.304	26.9	15.12
1909.29	27.3	15.15

Possibly a little change in distance and angle.

8255. Σ 2253. (7.5...10.2)

R. A. $17^h\ 52^m\ 55^s$ Decl. + 14° 38′

A and B

1910.280	77°6	14″91
.356	79.5	14.93
.375	78.6	14.95
1910.34	78.6	14.93

Change from proper motion of A.

A and C (10.3)

1910.280	63°75	73″61
.356	63.90	73.78
.375	63.85	73.43
1910.34	63.83	73.61

The change shown in the distance of C is not likely to be real; the first measure is only a single night.

8260. Σ 2252. (8.0...8.3)

R. A. $17^h\ 52^m\ 58^s$ Decl. + 2° 3′

A and C (8.7)

1909.227	164°17	94″31
.304	164.20	94.39
.378	164.12	94.36
1909.30	164.16	94.35

There is no indication of proper motion in A or in the comparison star, DM (2°) 3444, from these and the measures of 1890.

Some of the meridian positions give:

1825	161°1	96″6	Weisse
1850	162.3	92.7	Lamont
1880	164.7	96.5	A. G. Alb.

8268. Σ 2254. (8.3...8.7)

R. A. $17^h\ 53^m\ 27^s$ Decl. + 12° 27′

A and C (12.8)

1910.375	66°17	55″47
11.302	66.52	55.53
11.334	66.60	54.95
1911.00	66.43	55.32

No other measures. A very faint star near C.

8274. γ *Draconis*. β 633. (2.2...13.0)

R. A. $17^h 53^m 49^s$ Decl. + 51° 30′

A and B

1907.465	151°.78	20″.94
.485	151.10	21.03
1907.47	151.44	20.98

The nearest companion, B, appears to be moving with the bright star. The proper motion of γ *Draconis* is given in the star catalogues:

Auwers (F. C.)	0″.028	in	214°.6
Boss	0.027	in	197.9
Newcomb	0.025	in	194.0
Groombridge	0.021	in	206.2

A continuation of the measures of the several companions will furnish an independent value.

A and E (11.5)

1907.351	234°.35	97″.36
.465	234.55	97.43
.485	234.50	97.37
1907.43	234.47	97.39

A and G (11.5)

1907.351	28°.10	139″.31
.465	28.00	139.73
.485	27.91	139.60
1907.43	28.00	139.55

A and F (10.8)

1907.465	115°.82	125″.48
.485	115.68	125.22
1907.47	115.75	125.35

8280. OΣ (App.) 161. (6.3...8.2)

R. A. $17^h 54^m 29^s$ Decl. + 8° 52′

A and B

1911.280	76°.75	62″.35
.299	76.68	62.20
.302	76.55	61.75
1911.29	76.66	62.10

One of these stars may have a small proper motion.

A and C (10.5)

1911.299	126°.47	114″.29
.302	126.32	114.19
1911.30	126.40	114.24

8295. OΣ (App.) 163. (7.0...7.1)

R. A. $17^h 55^m 22^s$ Decl. + 62° 37′

A and B

1911.258	39°.93	57″.28
.260	40.58	57.57
.280	40.65	57.18
1911.27	40.39	57.34

One of these stars has a considerable proper motion. From the four positions by Δ, Fr and β, the apparent motion of B is:

0″.116 in 157°.4

To determine which is the moving star, I have measured a third star.

B and C (9.8)

1911.337	339°.22	183″.90
.353	339.32	183.73
1911.34	339.27	183.81

8303. τ *Ophiuchi*. Σ 2262. (5.0...5.7)

R. A. $17^h 56^m 33^s$ Decl. — 8° 11′

1907.293	259°.6	1″.73
.482	260.0	1.93
.485	260.7	2.01
1907.42	260.1	1.89

Nothing can be known of the orbit of this binary before the end of this century, and probably not then.

For the proper motion of τ *Ophiuchi* we have:

Auwers	0″.025	in	108°.6
Newcomb	0.075	in	124.1
Boss	0.045	in	152.5

8316. Ho 564. (7.0...12.7)

R. A. $17^h 57^m 37^s$ Decl. + 26° 22′

A and B

1908.331	324°.4	31″.23
.422	326.1	31.94
.537	324.2	31.30
1908.43	324.9	31.49

The measures of AB should be continued for a final value of the proper motion of A.

Measures	0″.747	in	164°.0
Porter	0.660	in	148.0

A and C (10.9)

1908.252	64°.50	82″.80
.331	64.00	82.70
.422	64.53	83.13
1908.33	64.34	82.88

In the *General Catalogue*, the distance of AB by Doolittle in 1902 should read 27″.82 instead of 24″.82. No other measures of AC.

8325. β 825. (8.4...13.0)

R. A. $17^h 58^m 20^s$ Decl. + 25° 22′

A and B

1910.397	192°.4	12″.34
.414	193.7	12.26
1910.41	193.0	12.30

B and C (8.5)

1910.337	233°.9	9″.76
.397	232.7	9.64
.414	231.5	9.86
1910.38	232.7	9.75

A and C (= Σ 2268)

1910.337	210°.08	20″.88
.414	209.93	20.61
.436	210.70	20.65
1910.40	210.24	20.71

A has a small proper motion. The other measures are given in the *General Catalogue.*

8340. 70 *Ophiuchi.* Σ 2272. (4.1...6.1)

R. A. $17^h 59^m 23^s$ Decl. + 2° 33′

A and B

1907.291	167°.7	2″.38
.293	166.4	2.51
.348	166.5	2.77
.482	165.5	2.72
1907.35	166.5	2.59

A and *a* (12.7)

1907.293	215°.7	46″.25
.312	215.4	46.04
.331	215.9	45.89
.348	215.5	46.10
1907.32	215.62	46.07

A and *d* (12.2)

1907.312	35°.25	106″.39
.331	34.92	106.37
.348	35.25	106.60
1907.33	35.14	106.45

From six positions of these small stars by Hl and β (1878-1907) we have for the proper motion of 70 *Ophiuchi:*

Measures of A*a*	1″.065	in	168°.3
Measures of A*d*	1.045	in	168.3

Some of the values in the star catalogues are:

Auwers	1″.126	in	170°.0
Boss	1.123	in	169.9
Newcomb	1.127	in	166.9

These measures are continued for further improvement in the value of the proper motion of the binary:

A and *a*

1910.452	218°.67	43″.68
.455	218.05	43.74
.473	217.55	43.80
1910.46	218.09	43.74

A and *d*

1910.452	34°.15	109″.01
.455	34.12	109.12
.473	33.55	109.06
.548	34.35	109.26
1910.48	34.04	109.11

8347. Σ 2777. (6.3...8.2)

R. A. $18^h 0^m 1^s$ Decl. + 48° 28′

A and C (10.0)

1910.225	286°.38	88″.37
.244	285.83	88.73
.260	285.83	89.03
1910.24	286.01	88.71

The only other position is that in Part II of the *General Catalogue.*

A is given a small proper motion:

Battermann 0″.017 in 96°.7

Further measures of C will give a new and better value.

8349. OΣ (App.) 165. (7.4...7.9)

R. A. $18^h 0^m 8^s$ Decl. + 4° 33′

1911.583	141°.70	66″.19
.602	142.43	66.12
.625	142.10	66.11
1911.60	142.08	66.14

No change since 1874.

8354. Σ 2278. (6.8...7.3)

R. A. $18^h 0^m 47^s$ Decl. + 56° 26′

A and D (9.3)

1909.148	191°.30	201″.20
.151	191.10	200.83
.164	191.20	200.86
1909.15	191.20	200.96

This has been measured:

1880.58	192°.02	202″.56	2n	Bl.

These positions give for the proper motion of A:

0″.116 in 252°.6

The measures should be continued later. The comparison star has a faint companion:

D and *d* (13.7)

1909.164	226°.2	5″.26
.186	225.4	5.02
1909.17	225.8	5.14

8359. 72 *Ophiuchi.* H 5943. (3.7...)

R. A. $18^h 1^m 40^s$ Decl. + 9° 33′

A and D (10.8)

1911.583	165°.55	54″.56
.625	166.30	54.40
.644	166.38	54.33
1911.62	166.08	54.43

The β measures of the faint star (1878-1911) give for the proper motion of 72 *Ophiuchi:*

0″.093 in 326°.0

Values from meridian observations are:

Boss	0″.110	in	323°.0
Auwers	0.116	in	318.5
Newcomb	0.111	in	322.8

8361. H 1313. (9.3...11.6)

R. A. $18^h 1^m 42^s$ Decl. + 28° 42′

1907.482	309°.1	14″.38
.504	310.0	14.50
.542	308.9	14.66
1907.51	309.3	14.51

The apparent change in the distance is not likely to be real.

8369. H V. 74. (6.7...9.5)

R. A. $18^h 2^m 17^s$ Decl. + 13° 3′

1911.583	137°.23	41″.88
.602	136.90	42.10
.625	136.90	42.05
1911.60	137.01	42.01

Unchanged.

8372. 99 *Herculis.* A. C. 15. (5.2...10.5)

R. A. $18^h 2^m 28^s$ Decl. + 30° 33′

A and C (11.5)

1912.296	52°.55	93″.70
.351	52.90	93.52
.353	53.26	93.13
1912.33	52.90	93.45

No other measures of the faint star. The proper motion of the close pair is:

Auwers	0″.135	in	301°.7
Paris	0.115	in	310.5
Boss	0.113	in	303.7

8380. 73 *Ophiuchi.* Σ 2281. (5.7...7.2)

R. A. $18^h 3^m 36^s$ Decl. + 3° 58′

AB and C (12.6)

1912.236	191°.45	67″.22
.274	191.00	66.98
.351	191.43	67.15
1912.28	191.29	67.12

The proper motion of the binary system is given from meridian positions:

Auwers	0″.022	in	119°.5
Boss	0.039	in	107.8

8381. S 700. (7.7...9.6)

R. A. $18^h 3^m 38^s$ Decl. — 16° 47′

A and B

1910.490	292°.1	18″.63
.493	292.1	18.81
.509	292.6	18.70
1910.50	292.3	18.71

A and C (8.0)

1910.490	353°.8	28″.80
.493	353.7	28.72
.509	353.6	28.56
1910.50	353.7	28.69

These stars form a part of *h* 1997. Probably unchanged.

8382. 102 *Herculis.* A. G. Clark 8. (5.5...12.5)

R. A. $18^h 3^m 38^s$ Decl. + 20° 48′

1911.241	136°.7	23″.84
.302	135.3	23.44
.334	136.6	23.31
.395	136.0	23.15
1911.32	136.1	23.44

The four measures (1878-1911) show no certain change. The proper motion of 102 *Herculis* is small:

Auwers	0″.015	in	212°.9
Boss	0.017	in	184.7

8383. Σ 2290. (8.5...10.8)

R. A. $18^h 3^m 39^s$ Decl. + 50° 0′

A and C (12.3)

1909.170	69°.50	177″.48
.186	69.68	177.44
.227	69.62	177.51
1909.19	69.60	177.48

The former measures are somewhat uncertain in distance:

1880.32	70°.12	177″.36	in	Bl
1880.80	70.00	176.25	in	Bl.

No material change in AB.

8384. Σ 2283. (7.2...7.7)

R. A. $18^h 3^m 43^s$ Decl. + 6° 8′

1909.515	80°.0	0″.86
.531	83.0	0.91
1909.52	81.5	0.88

Slow angular motion. The Herschel bright planetary nebula is about 1° distant *nf*. The 15 m star, near the central star, measured at Lick Observatory in 1891, was too faint for good measures here.

h 2000 and star 12.6 m

1909.512	308°.43	89″.19
.515	308.70	88.96
.531	308.37	89.06
1909.52	308.50	89.07

8388. β 637. (6.5...12.5)

R. A. $18^h\ 3^m\ 54^s$ Decl. + 3° 6′

A and C (10.8)

1910.490	237°.58	104″.97
.493	237.38	104.85
.509	237.47	104.86
1910.50	237.48	104.89

For the proper motion of AB.

Porter	0″.179	in	180°.0
Boss	0.185	in	166.0

8398½. Ho 267. (7.0...13.0)

R. A. $18^h\ 4^m\ 53^s$ Decl. — 5° 13′

1907.312	355°.0	14″.11
.348	355.6	13.94
.351	355.3	14.00
1907.34	355.3	14.02

The distance in the early measure of Ho is apparently too large.

8404. Σ 2291. (8.5...9.0)

R. A. $18^h\ 5^m\ 53^s$ Decl. + 34° 0′

1907.348	339°.7	27″.11
7.351	339.6	27.17
8.479	340.0	26.95
1907.73	339.8	27.08

Distance increasing. One of the components has a proper motion of 0″.025 in 339°. (± 180°). A third star should be connected.

8417. Σ 2293 *rej.* (7.8...10.5)

R. A. $18^h\ 6^m\ 46^s$ Decl. + 48° 22′

1907.329	82°.8	12″.88
.348	82.8	12.91
1907.34	82.8	12.90

The angle by Hu requires a correction of 180°. No early measures.

8440. Σ 2298. (8.5...9.7)

R. A. $18^h\ 8^m\ 51^s$ Decl. + 41° 21′

A and B

1908.422	179°.2	2″.17
.425	179.4	2.06
1908.42	179.3	2.11

Probably unchanged.

A and C (10.9)

1908.403	40°.30	77″.35
.422	40.22	77.29
.425	40.02	77.32
1908.42	40.18	77.32

The prior measures of C are discordant in distance, and further observations are required.

1881.29	39°.42	77″.53	1n	Bl
1881.77	40.08	78.47	1n	Bl.

8453. H 2827. (9.8...9.9)

R. A. $18^h\ 9^m\ 59^s$ Decl. — 19° 55′

1909.531	254°.2	20″.04
.534	253.2	19.82
1909.53	253.7	19.93

H 2827 is in the middle of *h* 2002, which is large and diffused.

8471. H 1317. (9.8...11.9)

R. A. $18^h\ 12^m\ 10^s$ Decl. + 27° 20′

1907.504	128°.6	17″.76
.523	129.0	17.76
1907.51	128.8	17.76

This is probably the pair measured by Miller. The other pairs were not found by sweeping in the immediate vicinity. (See Part II *General Catalogue.*)

8481. H 5494. (6.0...11.8)

R. A. $18^h\ 13^m\ 20^s$ Decl. + 7° 12′

1911.241	69°.70	39″.98
.299	68.60	39.86
.302	69.82	40.19
1911.28	69.37	40.01

The other measures are recent. The proper motion of A is:

Boss	0″.063	in	275°.5

8482. Σ 2305. (8.2...9.8)

R. A. $18^h\ 13^m\ 24^s$ Decl. + 51° 17′

A and C (10.6)

1908.403	197°.22	100″.39
.422	196.95	100.76
.425	197.18	100.76
1908.42	197.12	100.64

The only other measures are:

1880.58	197°.60	102″.02	2n	Bl.

If this distance was right, A should have a proper motion of 0″.058 in 229°.1. The measures should be repeated after a few years.

8483. Schj 16. (7.9...9.2)

R. A. $18^h\ 13^m\ 24^s$ Decl. — 5° 1′

1911.548	197°.8	2″.78
.564	200.1	2.69
.567	200.0	2.82
1911.56	199.3	2.76

Change in angle.

8485. Σ 2303. (6.7...9.2)

R. A. $18^h\ 13^m\ 34^s$ Decl. — 8° 2′

1908.594	224°.1	2″.76
.597	227.5	2.53
.613	227.8	2.54
1908.60	226.5	2.61

Perhaps some change in angle.

8492. A. G. 220. (9.1...9.2)

R. A. $18^h\ 14^m\ 21^s$ Decl. + 51° 0′

1911.433	307°.7	10″.88
.449	307.0	11.09
.468	307.2	10.83
1911.45	307.3	10.93

8496. 74 *Ophiuchi.* H 5495. (4.9...11.6)

R. A. $18^h\ 14^m\ 53^s$ Decl. + 3° 19′

1911.302	285°.7	27″.90
.337	286.6	28.06
.356	286.0	28.17
1911.33	286.1	28.04

A comparison of the late positions with that of 1878 indicates a small proper motion principally in declination, instead of R. A. as shown by the meridian observations, but the early position is on a single night, and therefore further measures are needed.

Auwers	0″.019	in	264°.1
Boss	0.015	in	258.7

For a further independent determination of this motion, I have measured a third faint star:

A and C (12.0)

1912.526	80°.00	58″.37
.542	79.90	57.85
.545	80.23	57.75
1912.53	80.04	57.99

8498. η *Serpentis.* Σ 8, App. I. (3.3...12.0)

R. A. $18^h\ 15^m\ 6^s$ Decl. — 2° 56′

1911.302	62°.65	168″.94
.337	62.70	168.67
.356	62.50	168.95
.373	62.48	168.80
1911.34	62.58	168.84

The measures of the small star (1836-1911) should give the proper motion of the large star with the highest accuracy. The seven positions by Σ, Δ, Hl and β, from measures on 20 n, give the proper motion of η *Serpentis:*

0″.887 in 217°.1

Other values are:

Auwers	0″.904	in	220°.6
Newcomb	0.886	in	220.4
Boss	0.898	in	218.9

8512. Σ 2311. (8.9...9.9)

R. A. $18^h\ 16^m\ 38^s$ Decl. + 11° 23′

1911.468	153°.3	5″.19
.471	154.5	5.12
.487	153.5	5.25
1911.48	153.8	5.19

From the measures by Σ, Δ, Sp, Lv and β on 19 n (1830-1911) we have the proper motion of A:

0″.047 in 193°.3

A and star 9.8 m

1911.487	333°.02	143″.07
.509	333.17	142.57
.526	333.22	142.71
1911.51	333.14	142.78

A and DM (11°) 3438 (9.5)

1911.487	289°.22	148″.86
.509	289.23	148.88
.526	289.15	149.05
1911.51	289.20	148.93

Later measures will give two independent values of the motion of A.

8574. 39 *Draconis.* Σ 2323. (4.7...7.7)

R. A. $18^h\ 22^m\ 10^s$ Decl. + 58° 44′

C and D (7.1...10.7)

1910.184	66°.57	198″.10
.206	66.33	197.94
.225	66.48	197.74
1910.20	66.46	197.93

The following is erroneously given as measured from A:

1880.03	65°.87	198″.08	2n	Bl.

There are many stars in the field nearer AB than this. One distant star was measured by mistake for D:

A and E (11.0)

1910.184	80°.50	150″.32
.206	80.07	150.74
1910.19	80.28	150.53

The proper motion of 39 *Draconis* is given:

Auwers	0″.065	in	326°.5
Boss	0.064	in	328.7

8576. H 1325. (10.8...11.5)

R. A. 18^h 22^m 16^s Decl. + 29° 45′

1907.331	297°.0	6″.86
.351	296.5	6.50
.425	297.0	6.88
1907.37	296.8	6.75

Probably no motion; but disagrees with Herschel's estimated position in 1828.

8578. *φ Draconis.* OΣ 353. (4.8...6.5)

R. A. 18^h 22^m 29^s Decl. + 71° 16′

AB and C (12.7)

1912.296	114°.85	70″.72
.312	114.25	70.96
.351	115.13	70.66
1912.32	114.74	70.78

No other measures. The proper motion of the large star has been given:

Auwers (Brad.)	0″.021	in	358°.7
Auwers (F. C.)	0.027	in	319.7
Boss	0.032	in	353.1

8579. Σ 2319. (7.2...7.6)

R. A. 18^h 22^m 30^s Decl. + 19° 13′

A and C (10.0)

1908.288	274°.4	39″.61
.444	274.5	39.72
.460	274.4	39.95
1908.40	274.4	39.76

The measures of the small star furnish data for a very accurate value of the proper motion of A. The measures of Σ, Δ and β (1829-1908) give:

Measures	0″.043	in	30°.0
A. G. Ber.	0.045	in	51.7

8595. Σ 2322. (5.7...11.0)

R. A. 18^h 24^m 8^s Decl. + 3° 59′

A and C (12.0)

1912.526	294°.95	66″.63
.542	295.73	66.74
.545	295.57	67.43
1912.53	295.42	66.93

A and D (12.1)

1912.526	193°.75	85″.47
.542	193.43	85.21
.545	193.48	84.77
1912.53	193.55	85.15

The magnitude of the principal star in DM is 7.0; no proper motion found in the catalogues examined. No sensible change in AB since Struve. No other measures of the distant stars.

8614. β 966. (6.7...)

R. A. 18^h 25^m 25^s Decl. — 19° 3′

β 966 is the principal star of the coarse cluster, Messier 25. Many of these stars were measured by Glasenapp, each on 2 n, and I have remeasured most of them in the hope of finding some small star with a sensible proper motion. As there is no indication of any change, the measures were not repeated. The results of the comparison are as follows:

AH	1890.52	295°.66	71″.65	Gla
	1909.59	295.38	72.27	β
AE	1890.52	282.02	145.16	Gla
	1909.59	281.68	144.95	β
EL	1890.52	122.25	21.03	Gla
	1909.59	122.55	21.05	β
EF	1890.52	290.71	25.06	Gla
	1909.59	291.32	25.23	β
EK	1890.54	26.44	30.73	Gla
	1909.59	27.68	30.33	β
CD	1890.50	172.07	11.94	Gla
	1909.59	171.90	11.23	β
PC	1890.55	263.92	93.59	Gla
	1909.59	263.69	93.67	β
PQ	1890.54	300.60	68.46	Gla
	1909.59	300.93	68.79	β
AP	1890.53	194.77	163.58	Gla
	1909.59	194.62	164.23	β
AR	1890.55	90.49	77.08	Gla
	1909.63	90.43	76.67	β
HJ	1890.52	310.70	43.47	Gla
	1909.63	310.78	44.27	β
JM	1890.54	345.57	70.36	Gla
	1909.63	345.32	70.23	β

The lettering as given in Glasenapp (I) is followed here.

8615. Σ 2329. (7.7...9.0)

R. A. 18^h 25^m 35^s Decl. + 6° 23′

1908.597	43°.6	4″.06
.613	44.7	4.20
.633	45.6	4.25
1908.61	44.6	4.17

No change in angle or distance since 1830.

8628. Σ 2333. (7.5...8.1)

R. A. 18^h 26^m 38^s Decl. + 32° 10′

A and B

1909.227	333°.6	6″.22
.266	333.4	6.11
1909.25	333.5	6.16

No relative motion.

A and C

1909.186	35°.25	163″.97
.227	35.05	163.58
1909.21	35.15	163.77

B and C (12.7)

1909.186	37°.13	161″.13
.227	36.90	161.08
.266	37.35	161.10
1909.23	37.13	161.10

The former measures of BC have too large a difference in distance to use the mean:

1880.31	37°.23	160″.16	1n	Bl
1880.75	37.32	161.24	1n	Bl.

8630. β 642. (9.0...11.0)

R. A. $18^h 26^m 45^s$ Decl. — 10° 32′

1911.449	88°.8	3″.79
.509	90.2	3.80
.526	89.8	4.00
1911.49	89.6	3.86

One of the brighter stars in *h* 3751.

8636. OΣ 355 *rej.* (6.2...9.5)

R. A. $18^h 27^m 38^s$ Decl. + 8° 11′

1912.564	248°.28	38″.55
.581	248.65	38.26
.583	248.45	38.38
1912.57	248.46	38.40

There is no certain change in the place of the companion since 1866.

8643. Σ 2340. (8.3...9.2)

R. A. $18^h 28^m 30^s$ Decl. + 31° 30′

B and C (9.4)

1909.186	155°.15	206″.73
.227	155.18	206.64
.266	155.05	206.65
1909.23	155.13	206.67

The previous position is:

1880.53	155°.47	206″.74	2n	Bl.

The measures tend to show that the proper motion is in A, the larger of the two small stars. The measures of AB make the annual motion 0″.022 on the line joining the stars.

8644. H 1329. (8.9...13.6)

R. A. $18^h 28^m 32^s$ Decl. + 11° 17′

1910.299	316°.8	15″.80
.395	317.7	15.96
1910.35	317.2	15.88

No other measures. H's angle is 328°.

8646. OΣ (App.) 171. (6.6...7.4)

R. A. $18^h 28^m 50^s$ Decl. + 38° 45′

A and B

1911.162	321°.30	143″.21
.164	321.20	143.11
.200	321.35	143.73
1911.18	321.28	143.35

The four positions by Δ, Fr and β give for the apparent motion of A:

0″.150 in 215°.7

To show whether or not there is any motion in B, I have connected a faint star:

A and *a* (10.7)

1911.162	138°.60	85″.90
.200	138.68	85.95
1911.18	138.64	85.92

The proper motions from the Paris catalogue are:

A	0″.082	in	154°.6
B	0.150	in	90.0

8650. OΣ 356 *rej.* (7.0...8.7)

R. A. $18^h 29^m 20^s$ Decl. + 40° 4′

A and B

1910.280	305°.45	34″.96
.299	305.88	35.33
.375	305.75	35.44
1910.32	305.69	35.24

A and C (9.5)

1910.280	4°.85	52″.06
.299	4.38	51.67
.375	4.53	51.88
1910.32	4.59	51.87

B and C

1910.280	46°.77	45″.52
.299	46.38	45.22
.375	46.48	45.33
1910.32	46.54	45.36

As there is no change in BC since 1866, it is obvious the motion is in the principal star. From the measures of Δ and β the proper motion of A is:

AB	R. A. — 0″.050	Decl. + 0″.051
AC	0.038	0.041
	— 0.044	+ 0.046

Therefore the proper motion of A is:

0″.063 in 316°.2

AC and BC are transposed in Part II of the *General Catalogue;* and so in Δ, Hu, and others.

8654. Σ 2342. (5.7...12.5)

R. A. $18^h 29^m 41^s$ Decl. + 4° 50′

A and C (8.5)

1910.531	6°.45	29″.54
.548	6.53	29.90
.551	6.98	29.53
1910.54	6.65	29.66

The large star not given in Boss (G. C.). From the measures of AC it has a proper motion of 0″.05 in 144°.

8660. Σ 2345. (8.4...10.1)

R. A. $18^h 30^m 23^s$ Decl. + 20° 59′

1911.241	206°.4	8″.76
.260	207.2	8.89
.280	205.8	8.78
1911.26	206.5	8.81

The measures of Σ, Δ, En, Hl and β on 23 n (1832-1911) give the proper motion of A:

0″.043 in 80°.2

8664. H 864. (7.0...12.0)

R. A. $18^h 30^m 34^s$ Decl. + 4° 52′

1910.493	322°.2	18″.32
.509	324.9	18.26
.531	322.0	18.30
1910.51	323.0	18.29

Slow motion in angle.

8685. Arg. 22. (8.0...8.5)

R. A. $18^h 32^m 28^s$ Decl. — 25° 37′

A and C (8.4)

1911.564	285°.47	53″.30
.583	285.68	52.72
1911.57	285.57	53.01

It is certain that there is a large error in the Washington measure of 1862. There is probably no change.

8689. Σ 2352. (7.3...10.3)

R. A. $18^h 32^m 39^s$ Decl. + 34° 46′

A and C (10.2)

1909.186	161°.05	209″.96
.266	161.35	210.01
.304	161.33	210.32
1909.25	161.24	210.10

No evidence of proper motion.

1880.31	161°.35	209″.75	in	Bl
1881.75	161.25	210.70	in	Bl.

8699. Σ 2350 *rej.* (6.7...11.0)

R. A. $18^h 33^m 30^s$ Decl. — 7° 54′

1907.293	195°.7	22″.04
.348	196.2	22.33
.351	196.2	21.76
1907.33	196.0	22.04

Change in distance is probable.

8702. H 1332. (7.8...9.2)

R. A. $18^h 33^m 47^s$ Decl. + 24° 33′

1910.493	229°.5	26″.34
.509	229.2	26.15
.548	228.9	26.24
1910.52	229.2	26.24

There may be a little change.

8707. Σ 2355 *rej.* (7.0...10.2)

R. A. $18^h 34^m 3^s$ Decl. + 7° 15′

1911.241	138°.07	25″.04
.260	137.63	24.91
.299	137.68	24.92
1911.27	137.79	24.96

8725. 2 *Aquilae.* H V. 36. (5.5...10.0)

R. A. $18^h 35^m 42^s$ Decl. — 9° 10′

1912.465	130°.06	52″.48
.504	130.30	52.68
.507	130.07	52.46
1912.49	130.14	52.51

The measures of the small star (1879-1912) show that 2 *Aquilae* has no sensible proper motion; and this is equally obvious from the meridian positions:

Auwers	0″.008	in	310°.2
Boss	0.014	in	106.7

8732. Σ 2368. (7.2...7.4)

R. A. $18^h 36^m 7^s$ Decl. + 52° 14′

A and B

1907.271	326°.7	1″.50
.329	327.9	1.62
1907.30	327.3	1.56

A and C (11.0)

1907.291	124°.5	36″.74
.312	124.6	36.52
.329	124.9	36.48
1907.31	124.7	36.58
1908.370	124°.98	36″.84
.460	124.33	36.63
.463	125.18	36.69
1908.43	124.83	36.72

Evidently a large error in the first measure of this in 1887 by Tarrant. Probably fixed.

8733. Hd Zones. (9.3...11.0)

R. A. $18^h\ 36^m\ 18^s$ Decl. + 0° 33′

1907.523	111°.1	11″.72
.540	109.2	11.82
.581	108.4	11.76
1907.55	109.6	11.77

Disagrees with the Cincinnati measures of 1879.

8736. Σ 2367. (7.0...7.5)

R. A. $18^h\ 36^m\ 39^s$ Decl. + 30° 11′

AB and E (11.0)

1909.340	341°.32	149″.19
.342	341.32	148.83
.438	340.93	148.88
1909.37	341.19	148.97

The prior measures are discordant and uncertain in distance.

1880.30	341°.83	150″.82	1n	Bl
1880.75	341.13	148.67	1n	Bl.

8748. Σ 2372. (6.7...8.2)

R. A. $18^h\ 37^m\ 48^s$ Decl. + 34° 38′

B and C (11.3)

1909.186	65°.25	91″.03
.266	65.05	90.86
.304	65.13	91.26
1909.25	65.14	91.05

Probably without change.

1879.99	64°.99	90″.74	2n	Bl.

8757. H 5501. (9.1...10.9)

R. A. $18^h\ 38^m\ 25^s$ Decl. — 1° 8′

1907.523	7°.7	23″.23
.540	7.4	23.14
.581	7.1	23.39
1907.55	7.4	23.25

No sensible change. This is DM (— 1°) 3556.

8759. Σ 2384. (8.0...8.5)

R. A. $18^h\ 38^m\ 33^s$ Decl. + 67° 0′

AB and C (12.4)

1910.375	166°.70	113″.55
.397	167.18	113.35
1910.39	166.94	113.45

For the proper motion of AB.

Porter	0″.233	in	324°.8
Schroeter	0.243	in	327.4

AB and Dreyer 6677

1910.40 Δ R. A. $4^m\ 55^s.0$ Δ Decl. 89″.8

Discovered by Swift. From this the position (1860) is:

R. A. $18^h\ 33^m\ 37^s$ Decl. + 67° 0′ 54″

There is another faint, diffused nebula in the field with 12.5 m star attached.

Dreyer 6677 and nebula

1910.397	157°.1	119″.76

8761. Σ 2374. (8.8...9.2)

R. A. $18^h\ 38^m\ 41^s$ Decl. + 27° 36′

A and B

1910.244	37°.9	14″.64
.260	37.7	14.56
.397	38.5	14.66
1910.30	38.0	14.62

A and DM (27°) 3088 (9.0)

1910.244	358°.58	150″.38
.260	358.17	149.68
.397	358.20	150.37
1910.30	358.32	150.14

Change doubtful in both.

1875	358°.6	150″.9	A. G. Camb.

8765. Σ 2378. (8.2...9.5)

R. A. $18^h\ 39^m\ 5^s$ Decl. + 35° 26′

B and C (10.8)

1910.225	247°.27	201″.86
.244	247.15	201.27
.260	247.03	201.42
1910.24	247.15	201.52

Evidently B has no sensible proper motion:

1880.60	247°.33	201″.25	2n	Bl.

8767. Σ 2376. (7.7...8.4)

R. A. $18^h\ 39^m\ 6^s$ Decl. + 30° 17′

A and B

1909.186	63°.3	22″.23
.266	63.8	22.11
.304	63.9	21.98
1909.25	63.7	22.11

A and C (10.8)

1909.186	207°.20	81″.61
.266	207.05	81.61
.304	207.33	81.37
1909.25	207.19	81.53

The measures furnish no evidence of any proper motion in Σ 2376:

1880.53 207°.61 81″.30 2n Bl.

8779. 5 *Aquilae.* Σ 2379. (5.6...7.4)

R. A. $18^h 40^m 17^s$ Decl. — 1° 5′

A and C (11.2)

1912.430	147°.1	26″.63
.465	146.5	25.93
.504	145.6	26.45
.507	145.8	26.45
1912.48	146.3	26.34

A and B have a small common proper motion. The measures of the faint star (1880-1912) show that this is not all in declination as would appear from the meridian positions.

Measures of AC	0″.038	in	128°.5
Auwers	0.034	in	192.8
Boss	0.031	in	194.0

8781. 46 *Draconis.* H VI. 37. (5.1...10.7)

R. A. $18^h 40^m 18^s$ Decl. + 55° 25′

1910.203	159°.75	146″.95
.206	160.10	146.32
.225	159.83	146.34
1910.21	159.89	146.54

The meridian observations show no certain proper motion in 46 *Draconis;* and the measures of the 10.7 m star give the same result:

1879.98 160°.43 146″.76 2n Bl.

Auwers	0″.041	in	295°.7
Boss	0.023	in	344.9
Groombridge	0.026	in	342.9

8792. Σ 2393. (7.3...10.0)

R. A. $18^h 41^m 6^s$ Decl. + 38° 11′

A and C (11.0)

1910.225	300°.03	179″.02
.244	300.19	178.88
.260	299.93	179.13
1910.24	300.05	179.01

An earlier position is:

1880.58 299°.69 178″.18 2n Bl.

If the measures are substantially correct, the Greenwich proper motion of A is in error, at least as to direction. According to that, the distance of the small star should decrease something more than 1″ in the interval.

Greenwich 0″.038 in 277°.5

8798. Σ 2398. (8.2...8.7)

R. A. $18^h 41^m 34^s$ Decl. + 59° 25′

A and B

1907.312	151°.7	17″.09
.329	151.8	17.19
.348	151.7	17.11
1907.33	151.7	17.13
1909.170	151°.8	17″.13
.266	152.0	17.13
.304	151.6	17.05
.342	151.9	17.11
1909.27	151.8	17.10

The change in B is very slow at this time.

A and C (11.0)

1907.312	235°.6	50″.71
.329	234.9	50.90
.348	235.8	50.55
1907.33	235.4	50.72
1909.170	231°.07	50″.74
.266	231.25	50.64
.304	230.50	50.89
.342	230.28	50.79
1909.27	230.78	50.76

The measures of C are continued for improving the proper motion of A. The change in AC is principally in angle.

Stumpe	2″.303	in	325°.4
Porter	2.286	in	324.5
Kustner	2.289	in	325.4
Krueger	2.299	in	325.6

The principal star is given a parallax of about 0″.3.

8810. Σ 2391. (6.2...9.0)

R. A. $18^h 42^m 14^s$ Decl. — 6° 8′

1907.523	332°.3	37″.94
.540	332.5	37.90
.581	332.7	38.18
1907.55	332.5	38.01

No change. There is a 13.5 m star near B, 107°.4: 12″.6.

8822. Σ 2397. (7.2...9.5)

R. A. $18^h 42^m 39^s$ Decl. + 31° 16′

1907.542	266°.6	3″.98
8.520	267.7	3.94
8.537	267.7	4.25
1908.20	267.3	4.06

No motion.

8824. Σ 2396. (7.7...11.2)

R. A. $18^h\,42^m\,49^s$ Decl. + 10° 38′

A and C (10.2)

1910.299	11°62	160″14
.375	11.50	160.34
.395	11.15	159.54
1910.36	11.42	160.01

A and D (10.5)

1910.299	47°95	176″44
.375	47.53	176.56
.395	47.42	176.54
1910.36	47.63	176.51

The prior measures give:

AC	1891.71	13°18	153″16	2n	Eng
AD	1891.72	50.31	173.53	2n	Eng.

These measures give for the movement of the large star

AC	R. A. + 0″176	Decl. -- 0″409
AD	0.168	0.437
	+ 0.172	— 0.423

Therefore the proper motion of A is:

0″457 in 157°9

Of course this is substantially the same as that given in the *General Catalogue* from the measures of AB.

Measures (AB)	0″463	in	164°8
Argelander	0.468	in	165.2
Stumpe	0.448	in	164.9
Porter	0.451	in	162.7
Paris	0.487	in	157.4

8827. H VI. 50. (6.4...12.5)

R. A. $18^h\,43^m\,15^s$ Decl. — 6° 3′

A and B

1912.564	357°9	23″19
.581	359.4	23.70
.583	359.8	23.15
1912.57	359.0	23.35

A and C (8.0)

1912.564	170°58	113″54
.581	171.03	113.38
.583	170.88	113.62
1912.57	170.83	113.51

Probably unchanged since 1879. No proper motion found for the bright star.

8863. H 1352. (7.2...9.5)

R. A. $18^h\,45^m\,24^s$ Decl. + 29° 40′

1909.340	246°1	12″03
.342	246.2	12.06
.438	246.7	12.22
1909.37	246.3	12.10

The angle is certainly increasing.

8871. H 870. (9.7...10.6)

R. A. $18^h\,45^m\,54^s$ Decl. + 10° 12′

A and B

1910.375	219°0	11″31
.452	220.0	11.56
1910.41	219.5	11.43

C and D

1910.452	23°7	22″10
.455	24.4	22.14
1910.45	24.0	22.12

A and C

1910.452	248°93	65″94
.455	248.95	65.95
1910.45	248.94	65.94

The components of H 870 form a part of *h* 2020.

8894. OΣ (App.) 176. (7.0...7.1)

R. A. $18^h\,48^m\,27^s$ Decl. + 1° 45′

1911.411	115°23	96″51
.414	115.03	96.51
.430	114.88	96.87
1911.42	115.05	96.63

One of these nearly equal stars has a small proper motion. A third star should be connected.

8902. Σ 2416. (8.0...10.2)

R. A. $18^h\,49^m\,15^s$ Decl. + 51° 11′

A and B

1907.312	157°8	17″34
.329	157.8	17.38
.348	157.8	17.40
1907.33	157.8	17.37
1909.186	157°2	17″29
.227	157.5	17.42
.266	157.4	17.22
1909.23	157.4	17.31

The measures by Σ, Δ and β (1830-1909) give for the proper motion of A:

0″022 in 342°3

A and DM (51°) 2446

1907.329	40°65	125″41
.348	40.50	125.40
1907.34	40.57	125.40
1909.186	40°60	125″39
.227	40.45	125.03
.266	40.78	123.17
1909.23	40.61	125.20

The relation of these stars in A. G. Harvard is:

1882 40°9 127″2

8906. *o Draconis.* Σ 2420. (4.6...7.6)

R. A. $18^h\ 49^m\ 25^s$ Decl. + 59° 14′

B and C (11.3)

1910.184	326°.82	106″.00
.203	326.95	106.52
.206	327.17	106.24
1910.20	326.98	106.25

The other measures are:

1880.37	327°.03	107″.80	2n	Bl.

Noted by Ball as difficult to measure. The apparent change in distance does not agree with the proper motion of A, and further measures should be made.

Measures (AB)	0″.099	in	84°.1
Auwers	0.080	in	77.0
Boss	0.086	in	74.5
Newcomb	0.092	in	75.8

8916. OΣ 525. (5.1...10.3)

R. A. $18^h\ 50^m\ 28^s$ Decl. + 33° 49′

C and D (7.1...10.7)

1910.184	284°.57	192″.66
.206	284.20	192.76
.225	284.60	192.69
1910.20	284.46	192.70

Many stars nearer to AB than this. No evidence of proper motion:

1880.00	284°.92	193″.19	2n	Bl.

The proper motion of the bright star (Bradley 2381) is small and doubtful:

Auwers	0″.075	in	266°.9
Boss	0.011	in	308.8

8917. Σ 2418 *rej.* (8.4...10.9)

R. A. $18^h\ 50^m\ 31^s$ Decl. + 26° 52′

1907.348	7°.7	16″.02
.351	8.0	15.99
.425	7.4	15.94
1907.37	7.7	15.98

No early measures.

8923. Ho 270. (5.6...14.5)

R. A. $18^h\ 51^m\ 1^s$ Decl. + 41° 27′

A and B

1907.465	306°.0	8″.31
8.520	306.7	8.48
1907.99	306.3	8.39

A and C (13.0)

1907.348	39°.8	23″.49
7.465	40.2	23.68
8.520	39.1	23.69
1907.78	39.7	23.62

The large star has no certain proper motion:

Boss 0″.007 in 189°.1

8926. β 1255. (5.8...12.5)

R. A. $18^h\ 51^m\ 37^s$ Decl. + 48° 43′

A and C (13.0)

1911.414	249°.2	34″.60
.433	249.9	34.68
.449	249.7	34.90
1911.43	249.6	34.73

For the proper motion of AB.

Paris	0″.173	in	191°.8
Boss	0.143	in	203.7

8929. H 5505. (10.5...10.5)

R. A. $18^h\ 51^m\ 56^s$ Decl. + 9° 33′

1910.493	144°.1	18″.96
10.512	143.6	18.80
10.531	143.4	18.80
10.545	144.2	19.04
11.356	143.9	19.02
1910.72	143.8	18.92

No other measures.

8932. Σ 3130. (7.4...11.1)

R. A. $18^h\ 52^m\ 20^s$ Decl. + 44° 4′

A and D (10.6)

1908.460	311°.30	180″.97
.463	311.40	180.90
.479	311.23	181.29
1908.47	311.31	181.05

The large star appears to have no sensible proper motion:

1880.58	311°.65	181″.26	2n	Bl.

8940. 11 *Aquilae.* Σ 2424. (5.7...9.2)

R. A. $18^h\ 53^m\ 34^s$ Decl. + 13° 28′

A and B

1911.411	268°.9	16″.77
.430	268.6	16.85
.449	269.3	16.69
1911.43	268.9	16.77

From six positions by Σ, Δ, HΣ, Hu and β on 21 n (1831-1911) the corrected proper motion of 11 *Aquilae* is:

0″.117 in 204°.5

There is no probability of any sensible motion in the small star.

Auwers	0″.115	in	190°.2
Bossert	0.111	in	187.6
Paris	0.117	in	180.0
Boss	0.120	in	179.3

This will be shown by later measures of the third star:

A and C (12.7)

1911.411	261°.96	78″.63
.430	262.68	78.79
.449	262.25	77.96
1911.43	262.30	78.46

8943. Σ 2427. (8.5...9.0)

R. A. $18^h\ 53^m\ 57^s$ Decl. + 38° 4′

A and B

1911.414	61°.68	49″.09
.433	61.62	49.06
.449	61.40	49.18
1911.43	61.57	49.11

From the measures by Σ, Δ, Sp and β on 14 n (1828-1911) the apparent proper motion of A is:

0″.063 in 222°.5

The measures of BC show that B has no proper motion.

A and DM (38°) 3373

1911.414	350°.50	159″.44
.433	350.42	159.34
.449	350.72	159.50
1911.43	350.55	159.43

The last comparison star, 6.2 m, is supposed to have no sensible proper motion:

Boss 0″.003 in 113°

8976. H 2849. (9.2...9.4)

R. A. $18^h\ 56^m\ 3^s$ Decl. — 15° 56′

1911.583	142°.5	19″.95
.602	144.0	20.23
.625	142.3	20.07
1911.60	142.9	20.08

Apparently unchanged. The 9 m star, SD (15°) 5192, is 28^s *p*, and a similar pair:

A and B (9.5...12.8)

1911.564	138°.1	12″.32
.625	135.7	12.26
1911.59	136.9	12.29

8977. Σ 2440. (6.5...9.0)

R. A. $18^h\ 56^m\ 5^s$ Decl. + 62° 14′

A and B

1908.441	124°.0	17″.01
.463	123.3	17.16
.479	123.3	17.30
1908.46	123.5	17.16

A and C (10.6)

1908.441	61°.28	160″.03
.463	61.10	160.29
.479	61.43	160.42
1908.46	61.27	160.25

The only other position of the distant star is:

1880.86	61°.80	159″.78	3n	Bl.

AB seem to make a system of the 61 *Cygni* type. The proper motion of A from the measures of C, and from meridian positions is:

Measures of C	0″.057	in	169°.3
Groombridge	0.057	in	165.0

The relative motion of B from the measures of AB by Σ, Δ and β (1832-1908) is:

0″.007 in 126°.0

8986. Σ 2434. (7.9...8.4)

R. A. $18^h\ 56^m\ 34^s$ Decl. — 0° 53′

B and C (10.3)

1910.452	53°.6	1″.40
.490	53.7	1.24
1910.47	53.6	1.32

About 15′ n of this is one of the planetary or stellar nebulae (Dreyer 6741). This is given in the DM as the 9.5 m star (— 0°) 3630. The diameter of the nebula is 6″.7.

Nebula and star 12.5 m

1910.452	327°.4	33″.67
.455	328.4	33.88
1910.45	327.9	33.77

Nebula and star 13.6 m

1910.452	268°.4	18″.30
.490	272.5	18.22
1910.47	270.4	18.26

About ½° *np* Σ 2434 is DM (— 0°) 3626 (7.4 m) which is the principal star of *h* 2025. This star has two small companions, and many more distant in the field.

A and B (13.9)

1910.452	2°.4	9″.72
.490	2.2	9.62
1910.47	2.3	9.67

A and C (13.0)

1910.452	304°.5	23″.07
.455	305.0	23.37
1910.45	304.7	23.22

8999. 16 *Lyrae*. H 1362. (6.0...11.5)

R. A. $18^h\ 58^m\ 3^s$ Decl. + 46° 46′

1909.266	279°.78	43″.03
.304	279.23	42.96
.340	279.00	42.80
1909.30	279.34	42.93

The proper motion of 16 *Lyrae* from my measures (1879-1909) is:

Measures	0″.077	in	164°.1
Groombridge	0.097	in	163.9
Boss	0.091	in	167.6

9000. Σ 2441. (7.7...9.3)

R. A. $18^h\ 58^m\ 7^s$ Decl. + 31° 13′

A and C (10.7)

1908.444	140°.97	96″.53
.460	141.45	96.20
.479	141.23	96.59
1908.46	141.22	96.44

If there is any proper motion in Σ 2441, it is evidently very small:

1880.54 141°.24 96″.10 2n Bl.

9015. Σ 2445.

R. A. $18^h\ 59^m\ 35^s$ Decl. + 23° 9′

Lalande 35667 is 56ˢ directly *p* Σ 2445, and has a distant companion measured by Glaisher in 1842 at Cambridge, and recently published.

A and B (8.0...10.8)

1910.184	321°.44	39″.45
.260	321.60	39.22
.280	321.85	39.12
1910.24	321.63	39.26

The early position is:

1842.67 320°.5 40″.45 2n Glaisher.

The principal star probably has a small proper motion.

9020. ζ *Aquilae*. β 287. (3.0...12.0)

R. A. $18^h\ 59^m\ 54^s$ Decl. + 13° 41′

A and C (11.8)

1909.340	76°.43	158″.86
.378	76.88	158.52
.381	76.73	158.50
1909.37	76.68	158.63

Further measures are needed, as the first is on a single night:

1879.34 76°.9 156″.65 1n β

Meridian values of the proper motion of ζ *Aquilae* are:

Auwers	0″.096	in	196°.7
Newcomb	0.100	in	186.6
Boss	0.102	in	184.9

9043. Σ 2455. (7.2...8.3)

R. A. $19^h\ 1^m\ 47^s$ Decl. + 21° 59′

A and C (12.0)

1911.280	22°.25	92″.65
.299	22.02	91.98
.334	22.19	92.74
1911.30	22.15	92.46

It is very probable that the change in AB is wholly due to the proper motion of the larger star, but as the companion is 8.3 m, it might have a small movement of its own. To test this, a faint star is connected.

Measures of AB	0″.064	in	185°.5
A. G. Berlin	0.073	in	214.8

9046. Σ 2458. (8.5...9.0)

R. A. $19^h\ 2^m\ 4^s$ Decl. + 27° 34′

A and B

1911.280	227°.2	11″.21
.299	226.7	11.50
.356	228.3	11.41
1911.31	227.4	11.37

A and DM (27°) 3248 (8.6)

1911.280	63°.03	70″.66
.299	63.38	69.97
.356	62.67	69.95
1911.31	63.03	70.19

From meridian positions:

1875 63°.8 71″.8 A. G. Camb.

9049. Σ 2459. (8.4...9.1)

R. A. $19^h\ 2^m\ 28^s$ Decl. + 25° 47′

1911.184	232°.9	13″.69
.280	233.4	13.77
.334	233.4	13.74
1911.27	233.2	13.73

No change in 80 years.

9053. 17 *Lyrae*. (5.3...11.0)

R. A. $19^h\ 2^m\ 55^s$ Decl. + 32° 19′

A small star of about the eleventh magnitude, in the field with 17 *Lyrae*, has a remarkable proper motion, perhaps the largest known in any star as faint as this. My later measures of this are as follows:

A and C

1905.717	66°.4	127″.37
5.720	66.4	127.73
5.736	66.5	127.66
1906.906	66.1	129.53
6.964	66.1	129.46
7.258	66.1	130.01
7.271	66.2	130.14
7.291	66.3	130.38
1908.444	65.45	132.12
.460	65.53	131.92
.479	65.69	131.79
.482	65.54	132.17
.518	65.30	132.05
1910.260	65.08	134.17
.299	65.35	134.76
.337	65.15	134.16
.356	65.20	134.70
.395	64.98	134.82
1911.241	65.03	135.70
.260	64.88	135.63
.280	65.28	135.39
.334	65.10	135.85
1912.236	64.88	137.56
.255	64.45	136.77
.274	64.55	137.54
.296	64.55	137.80

For other measures of this remarkable star see *Monthly Notices* **71**, 208.

The following are the mean results of all the measures of AC:

1887.81	72°.02	102″.28	1n	Eng
1894.85	69.23	112.31	2n	Eng
1905.72	66.40	127.59	3n	β
1907.14	66.16	129.90	5n	β
1908.47	65.50	132.01	5n	β
1910.33	65.15	134.52	5n	β
1911.28	65.06	135.64	4n	β
1912.26	64.61	137.42	4n	β

These positions give for the most probable apparent annual motion of C:

1″.542 in 45°.9

The proper motion of 17 *Lyrae*, with which the moving star was first compared, is given from meridian positions as follows:

Auwers	0″.112	in	68°.5
Newcomb	0.121	in	74.8
Boss	0.121	in	83.8

A more accurate value of this movement can be found from the measures of the other distant stars which it is certain have no sensible proper motion. The recent β measures are:

A and D

1906.906	295°.5	126″.51
6.964	295.6	126.51
7.258	295.7	126.03
7.271	295.3	126.32
7.291	295.7	126.61

A and E

1906.906	116°.5	150″.93
6.904	116.6	150.77
7.258	116.9	150.86
7.271	116.7	150.85
1908.460	116°.47	150″.88
.479	116.66	150.91
.482	116.50	151.19
.518	116.20	150.65
1910.299	116.52	150.52
.356	116.65	150.44
.375	116.33	150.58
.395	116.35	151.40

A and F

1906.906	356°.7	167″.54
6.964	356.8	167.47
7.271	357.2	167.71

The following are the mean results of these and other measures:

A and D

1887.73	296°.40	124″.34	2n	Eng
1894.85	296.00	125.32	2n	Eng
1905.72	295.70	126.12	1n	β
1907.14	295.56	126.40	5n	β

A and E

1887.81	116°.00	152″.65	1n	Eng
1894.85	116.37	152.20	1n	Eng
1905.72	116.50	150.75	1n	β
1907.10	116.67	150.85	5n	β

A and F

1887.73	357°.77	168″.20	2n	Eng
1894.85	357.50	168.11	2n	Eng
1907.05	356.90	167.57	3n	β

These measures give for the proper motion of 17 *Lyrae:*

AD	R. A. + 0″.1263	Decl. + 0″.0342
AE	0.1260	0.0224
AF	0.1307	0.0402
Mean	0.1277	0.0323

Therefore the corrected proper motion is:

0″.132 in 75°.8

Applying this to the apparent movement of C, we have for the real proper motion of that star:

1″.658 in 48°.2

For the purpose of obtaining a new and independent value of the proper motion of C, I have connected it with several other stars too faint to have any sensible movement, and these measures were repeated after an interval of two years. The recent measures of these and other stars in the field are as follows:

C and E

1908.444	173°.28	122″.60
.460	172.93	122.51
.479	173.43	122.70
.537	173.42	122.61
1910.260	174.18	124.06
.299	174.53	124.23
.337	174.27	124.40
.356	174.48	124.56
.375	174.70	124.30

C and G (11.3)

1908.444	119°.80	130″.78
.460	119.80	130.44
.479	120.01	130.67
.482	119.89	130.97
.518	119.54	130.63
1910.260	120.75	129.55
.299	121.25	130.22
.337	121.07	129.79
.356	121.35	129.82
.375	121.40	129.64

C and H (12.1)

1908.460	29°.10	163″.07
.479	29.10	163.02
.482	29.30	163.21
.518	29.15	163.00
1910.260	28.58	160.02
.299	28.92	159.96
.337	28.50	160.27
.375	28.83	159.93
.395	28.45	160.12

C and *c* (13.6)

1908.479	52°.03	63″.23
.482	52.07	63.14
.518	52.88	63.11
1910.260	52.50	60.10
.279	51.55	60.07
.337	52.03	60.08
.397	52.50	59.44

E and G

1910.444	60°.32	113″.37
.460	60.20	113.59
.479	60.45	113.64
.482	60.47	113.77
.518	60.05	113.91
1910.260	60.23	113.37
.337	60.30	114.02
.375	60.43	113.66
.395	59.98	113.91

A and E

1908.460	116°.47	150″.88
.479	116.66	150.91
.482	116.50	151.19
.518	116.20	150.65
1910.299	116.52	150.52
.356	116.65	150.44
.375	116.33	150.58
.395	116.35	151.40

The mean results of the two sets of measures of the small stars around C are:

CE	1908.48	173°.26	122″.60	4n
	1910.32	174.43	124.31	5n
CG	1908.47	119.81	130.70	5n
	1910.32	121.16	129.80	5n
CH	1908.48	29.16	163.07	4n
	1910.33	28.81	160.06	5n
C*c*	1908.49	52.33	63.16	3n
	1910.32	52.14	59.92	4n
EG	1908.47	60.30	113.66	5n
	1910.34	60.24	113.74	4n
AE	1908.48	116.46	150.91	4n
	1910.36	116.62	150.74	4n

As would be expected, there is no change in EG, and none in AE except that due to the motion of A. From the four stars connected with C we have for the proper motion of that star:

CE	R. A. + 1″.255	Decl. + 1″.070
CG	1.340	1.318
CH	1.265	1.162
C*c*	1.470	1.000
	1.333	1.137

Therefore the annual proper motion of C is:

1″.752 in 49°.5

The agreement with the former result from the measures of AC is all that could be expected when it is considered that the time interval is less than two years.

9093. Schj 19. (8.6...9.0)

R. A. 19ʰ 5ᵐ 57ˢ Decl. + 0° 43′

1909.531	257°.63	50″.49
.534	257.80	50.37
1909.53	257.71	50.43

Hind's nebula about 15′ distant *np* is large and diffused, with no definite point for measurement; might be a cluster of very faint stars.

9094. Σ 2477 *rej.* (8.5...10.5)

R. A. 19ʰ 6ᵐ 0ˢ Decl. — 4° 40′

1911.548	45°.5	27″.59
.564	45.2	27.46
.567	45.8	27.80
1911.56	45.5	27.62

Further measures are needed to confirm the apparent change shown by the single measure of Mitchel in 1848.

9116. β 139. (6.7...8.0)

R. A. 19ʰ 7ᵐ 12ˢ Decl. + 16° 39′

AB and C (7.5)

1911.334	285°.70	114″.66
.356	285.30	114.56
.373	285.53	114.73
1911.35	285.51	114.65

From five positions on 14n by Δ, Fr, A and β (1874-1911) the apparent motion of C is:

0″.234 in 150°.7

Therefore if the meridian value is correct, AB has no sensible motion. To test this, I have connected faint stars with each.

AB and *a* (13.0)

1911.334	102°6	28″00
.411	104.3	27.50
.414	102.7	27.51
1911.39	103.2	27.67

C and D (9.7)

1911.334	261°02	125″01
.356	260.77	124.74
.373	260.75	125.28
1911.35	260.85	125.01

The proper motions are given by Auwers:

A	0″030	in	270°0
B	0.223	in	148.5

9118. 21 *Aquilae.* H 879. (5.3...12.3)

R. A. 19ʰ 7ᵐ 39ˢ Decl. + 2° 5′

1912.526	286°35	36″39
.545	287.03	36.21
.562	287.55	36.36
1912.54	286.98	36.32

The proper motion of 21 *Aquilae,* if any, is small and uncertain from the meridian positions:

Auwers	0″018	in	306°3
Newcomb	0.003	in	327.2
Boss	0.007	in	206.6

The only other measures of B are my own. These measures, continued for the proper time, will give the real movement of the large star.

9123. Σ 2483. (7.2...8.3)

R. A. 19ʰ 7ᵐ 44ˢ Decl. + 30° 9′

A and B

1907.523	318°4	9″67
7.542	317.6	9.96
8.249	317.5	9.93
1907.77	317.8	9.85

A and C (8.5)

1907.523	236°5	70″83
7.542	236.5	71.45
8.249	236.5	70.69
1907.77	236.5	70.99

No material change in either.

9135. H 1377. (7.0...12.9)

R. A. 19ʰ 8ᵐ 51ˢ Decl. + 47° 10′

1912.411	356°2	36″50
.427	356.8	36.03
.430	357.3	36.03
1912.42	356.8	36.19

The prior measures are too recent to show whether or not the small proper motion given in the *General Catalogue* belongs to the companion.

9137. *Cygni* 6. Σ 2486. (6.0...6.5)

R. A. 19ʰ 9ᵐ 0ˢ Decl. + 49° 37′

A and C (12.7)

1910.436	6°60	55″91
.452	7.00	55.82
.471	7.40	55.83
1910.45	7.00	55.85

A and D (10.8)

1910.436	84°75	172″59
.452	84.67	173.07
.471	84.87	173.41
.473	84.65	173.45
1910.46	84.73	173.13

For the proper motion of AB. The stars AB appear to make a system of the 61 *Cygni* class. An earlier measure of AD is:

1881.52	78°31	170″69	37n	Bl.

From the two measures of this star we have for the proper motion of A:

0″671 in 344°3

As the first position is the mean of a large number of measures, the resulting movement, with a thirty-year interval, should have the highest degree of accuracy.

Other values from meridian observations are:

Porter	0″658	in	341°9
Paris	0.602	in	342.0
Groombridge	0.644	in	344.6
Boss	0.654	in	343.1

This star is frequently erroneously called 6 *Cygni,* which is No. 9374 of the *General Catalogue.*

9144. η *Lyrae.* Σ 2487. (4.0...8.1)

R. A. 19ʰ 9ᵐ 40ˢ Decl. + 38° 56′

A and C (10.6)

1909.340	151°18	161″53
.342	151.32	161.59
.378	151.28	161.28
1909.35	151.26	161.47

The only other measure is:

1880.00	151°78	161″09	1n	Bl.

No sensible change in AB. If the large star has any proper motion at all, it is wholly uncertain.

Auwers	0″020	in	299°7
Groombridge	0.006	in	108.9
Boss	0.003	in	270.0

9149. OΣ (App.) 178. (5.5...7.5)

R. A. 19ʰ 9ᵐ 52ˢ Decl. + 14° 53′

1911.583	267°20	89″91
.602	267.75	89.75
.622	267.60	89.60
1911.60	267.52	89.75

No change since 1875, and the stars have a common proper motion if any.

Boss 0″020 in 171°7

9157. OΣ 368. (7.3...8.5)

R. A. $19^h\ 10^m\ 37^s$ Decl. + 15° 57′

AB and C

1907.542	100°.7	16″.88
.578	99.6	16.78
.638	101.7	16.77
1907.59	100.7	16.81

No apparent change since 1878.

9166. 1 *Vulpeculae*. H 2862. (4.8...11.8)

R. A. $19^h\ 11^m\ 3^s$ Decl. + 21° 11′

1911.583	12°.78	38″.98
.602	12.78	39.25
.644	12.57	39.15
1911.61	12.71	39.13

The measures (1901-1911) imply a motion of about 0″.015, and about the same in R. A. as in Decl., but further measures are needed for a definite value of the motion.

Auwers	0″.012	in	265°.4
Boss	0.004	in	270.0

9171. OΣ 370. (7.5...8.2)

R. A. $19^h\ 11^m\ 19^s$ Decl. + 9° 8′

1907.542	14°.1	19″.75
.581	14.1	19.62
.597	14.9	19.45
1907.57	14.4	19.61

No change since 1846. A small star, A*a* 78°.1 : B*a* 128°.0.

9184. H 2863. (6.2...11.7)

R. A. $19^h\ 12^m\ 10^s$ Decl. — 15° 44′

1909.534	17°.74	48″.63
.627	17.74	48.65
.666	17.03	48.42
1909.61	17.50	48.57

A continuation of the measures, commenced in 1900, will give a more exact value of the proper motion of A.

Some of the values from meridian positions are:

Stumpe	0″.293	in	204°.7
Porter	0.274	in	205.0
Boss	0.285	in	201.1
Paris	0.317	in	197.0

9185. *Cygni* 9. Σ 2496. (7.0...10.8)

R. A. $19^h\ 12^m\ 10^s$ Decl. + 49° 52′

A and C (10.7)

1909.266	242°.10	185″.34
.342	241.95	185.60
.381	242.20	185.81
1909.33	242.08	185.58

The prior measures are discordant in distance.

1881.31	242°.42	186″.04	In	Bl
1881.78	242.36	185.15	In	Bl.

For the proper motion of the principal star (Groombridge 2802) we have:

Groombridge	0″.017	in	249°.9

9186. *θ Lyrae*. Sh 292. (4.5...8.8)

R. A. $19^h\ 12^m\ 12^s$ Decl. + 37° 55′

A and B

1908.463	70°.92	99″.99
.479	71.10	99.48
.518	70.83	99.83
1908.49	70.95	99.77

A and C (11.5)

1908.463	127°.90	100″.71
.479	127.97	100.99
.518	127.35	100.45
1908.49	127.74	100.72

The only other measures of C are:

1879.76	127°.02	99″.18	In	Bl
1880.25	127.62	99.91	In	Bl.

The proper motion of *θ Lyrae* is small and uncertain:

Auwers	0″.012	in	299°.4
Boss	0.011	in	254.3
Newcomb	0.019	in	289.5

The measures of C should be continued.

9189. 23 *Aquilae*. Σ 2492. (5.5...9.5)

R. A. $19^h\ 12^m\ 26^s$ Decl. + 0° 52′

A and C (13.7)

1911.411	61°.8	12″.36
.468	60.9	12.56
.471	60.5	11.99
1911.45	61.1	12.30

The only other measures of the faint star are my own in 1905. The proper motion of 23 *Aquilae* is uncertain.

Auwers	0″.033	in	312°.5
Boss	0.015	in	11.3

9192. β 1256.

R. A. $19^h\ 12^m\ 36^s$ Decl. + 6° 7′

The central star of the planetary nebula 12′ *n* of β 1256 is excessively faint.

h 2037 and star (15.8...13.0)

1909.534	70°.9	48″.81
.592	72.2	48.89
1909.56	71.5	48.85

The measures at Lick Observatory give:

1891.57	73°.3	49″.36	2n	β.

9195. 24 *Aquilae*. Σ 40, App. I. (6.0...6.2)

R. A. $19^h\ 12^m\ 40^s$ Decl. + 0° 8′

A and *a* (12.1)

1911.411	160°.20	49″.28
.430	160.58	49.88
.468	160.10	49.42
1911.44	160.29	49.53

B and *b* (11.0)

1911.411	302°.46	59″.62
.430	302.15	59.83
.468	302.23	60.02
1911.44	302.28	59.82

If the larger star has any proper motion, it is wholly uncertain from meridian positions:

Auwers	0″.061	in	287°.1
Boss	0.009	in	341.6

No other measures of the faint stars.

9204. Σ 2494 *rej.* (7.4...9.5)

R. A. $19^h\ 13^m\ 36^s$ Decl. — 6° 51′

1911.529	81°.6	25″.17
.545	81.8	25.65
.548	82.4	25.50
1911.54	81.9	25.44

Disagrees with Mitchel in 1848.

9207. 28 *Aquilae*. S 717. (5.6...8.3)

R. A. $19^h\ 14^m\ 3^s$ Decl. + 12° 9′

A and B

1912.526	174°.73	60″.54
.545	175.37	60.28
.562	175.60	60.34
1912.54	175.23	60.39

No change in the last 50 years.

A and C (13.0)

1912.526	105°.33	......
.545	105.27	......
.562	105.35	......
1912.54	105.32	......

B and C

1912.526	58°.17	......
.545	58.43	......
.562	58.48	......
1912.54	58.36	......

The faint star makes a nearly equilateral triangle with A and B. The proper motion of 28 *Aquilae* is not certain:

Auwers	0″.029	in	310°.8
Boss	0.018	in	355.3

9210. Σ 2500 *rej.* (8.0...10.5)

R. A. $19^h\ 14^m\ 11^s$ Decl. + 19° 30′

1911.280	24°.1	20″.01
11.302	23.7	20.30
11.334	23.3	19.91
12.296	23.2	20.16
1911.55	23.6	20.09

The measures are all too recent to show whether the small proper motion of A is correct.

A. G. Ber.	0″.062	in	280°.3

9225. OΣ (App.) 181. (6.2...6.3)

R. A. $19^h\ 15^m\ 15^s$ Decl. + 26° 26′

A and B

1910.529	3°.60	56″.66
.548	3.80	56.50
.551	3.75	56.54
1910.54	3.72	56.57

To determine which of these large stars has the proper motion, I have measured two faint stars.

From the measures of AB (1875-1910) this motion is:

0″.068 in 153°.1 (± 180°)

A and *a* (12.8)

1910.529	169°.38	36″.15
.548	169.00	36.32
.551	169.53	36.22
1910.54	169.30	36.23

B and *b* (12.0)

1910.529	41°.70	94″.07
.548	41.77	93.37
.551	41.72	93.72
1910.54	41.73	93.72

9234. H 1386.

R. A. $19^h\ 15^m\ 42^s$ Decl. + 47° 48′

The declination of this pair in Part I of the *General Catalogue* should be 47° instead of 45°.

9242. A. G. 229. (9.1...9.3)

R. A. $19^h\ 15^m\ 56^s$ Decl. + 8° 58′

1907.559	168°.0	34″.86
.562	168.2	34.81
.578	168.2	34.76
1907.57	168.1	34.81

The measures given in the *General Catalogue* as of this pair from Solá (A. N. 3529), really belong to a similar pair $3^m\ 52^s$ *f* and 5′ *s*. The components are DM (8°) 4092 and 4093; magnitudes 8.5 and 8.7.

1907.559	346°.3	25″.58
.562	346.3	25.54
.578	345.5	25.36
1907.57	346.0	25.49

Both of these stars are given in A. G. Leip.

9251. Σ 2514. (9.0...11.3)

R. A. $19^h\ 16^m\ 49^s$ Decl. + 67° 28′

A and DM (67°) 1134 (9.5)

1910.490	253°.75	139″.02
.493	253.85	139.05
1910.49	253.80	139.03

A and DM (67°) 1142 (8.9)

1875	Δ R. A. + 104^s.1	Δ Decl. — 162″.4	A. G. Chris.
1910.5	104.0	161.9	β

For the proper motion of A. The measures of AB (1832-1903) give this:

0″.121 in 191°.1

9266. H 886. (10.5...11.5)

R. A. $19^h\ 18^m\ 5^s$ Decl. + 21° 55′

1910.493	46°.8	8″.26
.509	46.8	8.15
.529	46.2	7.86
1910.51	46.6	8.09

H 886 is in the central part of *h* 2039. No other measures.

9270. H 1391. (8.9...10.3)

R. A. $19^h\ 18^m\ 24^s$ Decl. + 40° 46′

1909.227	95°.4	19″.81
.493	95.5	19.91
1909.36	95.4	19.86

No other measures. A is nearly in the center of an equilateral triangle; the star measured is the brighter of the three. H gave 81°.4.

9282. Σ 2515. (8.0...9.0)

R. A. $19^h\ 19^m\ 23^s$ Decl. + 21° 17′

A and C (11.8)

1910.493	181°.95	68″.90
.509	181.20	68.63
.529	181.40	68.77
1910.51	181.52	68.77

For an independent value of the proper motion of A. From the measures of AB (1829-1905) the motion of the principal star is:

0″.121 in 6°.3

9291. OΣ 372. (7.0...8.8)

R. A. $19^h\ 19^m\ 48^s$ Decl. + 46° 58′

A and B

1907.542	56°.5	78″.82
.559	56.6	79.14
.578	56.4	78.74
1907.56	56.5	78.90

No material change since 1849.

9294. 4 *Vulpeculae.* H 2871. (5.4...11.0)

R. A. $19^h\ 20^m\ 12^s$ Decl. + 19° 34′

A and B

1907.523	105°.0	24″.46
.542	106.4	24.03
.562	104.9	24.18
1907.54	105.4	24.22
1908.444	104°.85	23″.65
.460	106.30	23.91
.479	105.48	24.10
.482	105.83	24.50
1908.47	105.61	24.04

A and C (11.7)

1908.460	198°.83	53″.91
.479	198.87	53.79
.482	198.68	54.16
1908.47	198.79	53.95

No other measures of C. The six positions of AB (1887-1908) give for the proper motion of 4 *Vulpeculae:*

0″.113 in 130°.8

From meridian observations:

Auwers	0″.081	in	143°.5
Boss	0.106	in	133.7

9295. Espin. (8.8...9.9)

R. A. $19^h\ 20^m\ 14^s$ Decl. + 64° 19′

1910.490	218°.0	4″.73
.493	220.0	4.69
.509	219.8	4.58
1910.50	219.3	4.67

9300. 3 *Cygni.* (6.4...10.8)

R. A. $19^h 20^m 28^s$ Decl. + 24° 42′

1911.184	66°.95	34″.02
.280	66.85	33.86
.299	66.80	33.97
.302	67.29	33.97
1911.27	66.97	33.95

From the seven positions by OΣ and β (1867-1911) the proper motion of 3 *Cygni* is:

0″.651 in 195°.3

Some of the star catalogue results are:

Auwers	0″.658	in	198°.1
Paris	0.655	in	196.9
Boss	0.658	in	196.5

9304. H 1395. (8.8...8.8)

R. A. $19^h 20^m 52^s$ Decl. + 36° 53′

1907.542	66°.1	2″.71
8.444	65.1	2.67
8.520	64.4	2.70
1908.17	65.2	2.69

Probably fixed.

9308. Σ 2521. (5.5...10.3)

R. A. $19^h 21^m 14^s$ Decl. + 19° 39′

A and B

1908.444	37°.97	24″.90
.460	37.87	24.95
.479	38.67	24.98
1908.46	38.17	24.94

A and C (9.5)

1908.444	322°.40	70″.14
.460	322.53	70.37
.479	322.60	70.06
1908.46	322.51	70.19

A and D (9.5)

1908.444	63°.83	149″.72
.460	64.03	149.51
.479	64.10	149.59
1908.46	63.99	149.61

The proper motion of the principal star (Bradley 2462) as given from meridian observations seems to be certainly wrong in amount and direction:

Auwers	0″.075	in	237°.8
A. G. Ber.	0.074	in	223.3
Boss	0.057	in	197.4

The five sets of measures of AB by Σ, Δ, Per and β (1829-1908) give for this motion:

0″.041 in 178°.4

This is confirmed by the measures of AD which give:

0″.043 in 161°.2

The only prior position of this star is:

1878.61 64°.48 149″.46 3n Bl

Of AC there is only a single measure, and later observations should be made of both.

There is a 14 m star about the same distance as B from A, 73°.5 : 25″.0.

9317. β 1286. (8.3...9.0)

R. A. $19^h 21^m 39^s$ Decl. + 35° 41′

A and B

1907.523	104°.7	6″.16
7.542	105.7	6.51
8.370	103.6	6.19
8.482	102.9	6.12
1907.98	104.2	6.24
1909.534	102°.2	6″.50
.570	102.5	6.12
.589	101.8	6.27
1909.56	102.2	6.30

B and C (12.5)

1908.482	145°.6	0″.98
.520	141.4	0.90
1908.50	143.5	0.94

A and D (11.0)

1908.518	38°.7	37″.53
.520	38.3	37.32
.537	38.5	37.92
1908.52	38.5	37.59

B and D

1908.518	28°.9	35″.51
.520	28.6	35.16
.537	29.5	35.72
1908.52	29.0	35.46

Further measures are needed to determine the true relation of the three components of the triple. There is proper motion in A or B of about 0″.18. (See *General Catalogue* Part II.)

The measures of D should be continued.

9320. Ho 449. (9.0...12.3)

R. A. $19^h 21^m 41^s$ Decl. + 27° 8′

1907.348	177°.8	13″.69
.351	179.0	13.68
.463	179.9	13.87
1907.38	178.9	13.75

Measures discordant, and change doubtful.

9335. H 887. (7.0...13.2)

R. A. $19^h\ 22^m\ 54^s$ Decl. — 7° 17′

1912.408	347°.7	35″.14
.430	347.7	35.34
.465	349.6	34.91
1912.43	348.3	35.13

The large star is supposed to have a small proper motion.

Radcliffe 0″.054 in 303°.9

The other measures are too recent to give an independent value. The observations should be continued.

9355. Σ 2532. (6.0...10.2)

R. A. $19^h\ 24^m\ 9^s$ Decl. + 2° 39′

A and B

1911.430	4°.15	34″.13
.487	4.40	33.90
.529	4.08	33.71
1911.48	4.21	33.91

The four positions by Σ, Δ and β, each on 3 n (1829-1911) give the proper motion of A:

0″.014 in 23°.9

There is a 13.5 m star nearer A, and making an equilateral triangle with AB, A*a* 70°.7: B*a* 134°.3.

B and C

1911.529	134°.6	33″.97

No proper motion found in meridian lists; and not given in Boss' *General Catalogue.*

9357. H 888. (9.6...10.4)

R. A. $19^h\ 24^m\ 13^s$ Decl. + 9° 2′

1911.414	230°.6	10″.13
.433	231.4	10.51
.468	230.4	10.27
1911.44	230.8	10.30

No other measures.

9358. Ho 578. (7.0...12.0)

R. A. $19^h\ 24^m\ 28^s$ Decl. — 6° 45′

1911.526	106°.4	23″.77
.529	105.4	23.55
.545	105.3	23.54
1911.53	105.7	23.62

From the four positions by Ho, Doo and β on 12 n (1894-1911) the proper motion of the principal star is:

0″.166 in 249°.4

From meridian observations:

Porter	0″.188	in	233°.1
Bossert	0.220	in	251.4
Paris	0.149	in	224.2

9360. H 889. (8.5...11.2)

R. A. $19^h\ 24^m\ 29^s$ Decl. + 9° 3′

1911.414	100°.4	25″.54
.433	99.4	25.28
.468	99.3	25.53
1911.44	99.7	25.45

No other measures.

H 889 and *h* 2043

1911.43 Δ R. A. + $82^s.7$ Δ Decl. — 215″.5

There is a faint pair involved in *h* 2043, referred to by Herschel; magnitudes, 11.2 and 12.2:

1911.414	230°.8	15″.98
.468	231.7	16.42
1911.44	231.2	16.20

9399. OΣ 374 *rej.* (7.2...10.7)

R. A. $19^h\ 27^m\ 51^s$ Decl. + 49° 57′

1907.542	296°.8	18″.62
8.370	296.5	18.77
8.444	296.9	18.77
1908.12	296.7	18.72

No certain change. The proper motion of the large star is given in Groombridge:

0″.039 in 98°.8

9401. Σ 2540. (7.5...9.0)

R. A. $19^h\ 28^m\ 3^s$ Decl. + 20° 9′

A and C (12.8)

1912.296	220°.88	147″.30
.351	220.83	147.00
.353	221.23	146.89
1912.33	220.98	147.06

No other measures of C. The relative motion in AB is small and uncertain. The proper motion of A is given:

A. G. Berlin 0″.057 in 357°.2

9404. μ *Aquilae.* β 653. (4.8...13.0)

R. A. $19^h\ 28^m\ 14^s$ Decl. + 7° 8′

A and B

1908.460	280″.03	29″.34
.482	280.40	29.20
.518	279.92	29.14
1908.49	280.12	29.23

A and C (13.0)

1908.460	292°.35	28″.86
.482	292.00	29.32
.518	291.00	29.02
1908.49	291.78	29.07

A and D (11.0)

1908.460	345°.75	63″.06
.482	345.57	63.04
.518	345.48	62.91
1908.49	345.60	63.00

A and E (9.4)

1908.460	70°.30	179″.43
.482	70.30	179.74
.518	70.35	179.51
1908.49	70.32	179.56

From the measures of the several companion stars, we have the following for the movement of A:

AB	R. A. + 0″.250	Decl. — 0″.110
AC	0.227	0.166
AD	0.238	-0.111
AE	0.244	0.167
	+ 0.240	— 0.138

Therefore the true proper motion of μ *Aquilae* is:

0″.277 in 119°.9

From meridian positions we have:

Auwers	0″.233	in	124°.7
Boss	0.261	in	125.5
Newcomb	0.261	in	124.3

9438. Espin 129. (9.4...10.3)

R. A. $19^h\,30^m\,18^s$ Decl. + 52° 33′

A and B

1908.266	221°.5	3″.29
.331	224.9	3.26
.370	226.3	3.52
1908.32	224.2	3.36

A and DM (52°) 2458

1908.266	273°.15	71″.77
.331	273.22	71.86
.370	273.52	71.86
1908.32	273.30	71.83

There is an error of 1° in the declination given by Espin, and repeated in Part I of the *General Catalogue*. It should be + 52° 33′. The principal star is DM (52°) 2459.

9447. Lalande 37162. (7.5...10.3)

R. A. $19^h\,31^m\,8^s$ Decl. — 10° 15′

A and B

1912.526	285°.90	82″.10
.545	286.03	82.28
.562	286.62	82.13
1912.54	286.18	82.17

B and C (11.1)

1912.526	284°.6	4″.30
.545	284.0	4.02
.562	283.2	4.07
1912.54	283.9	4.13

The only other measures of AB are my own. No evidence of change in BC.

9457. H 892. (9.0...11.4)

R. A. $19^h\,31^m\,50^s$ Decl. — 8° 35′

1907.523	15°.3	23″.42
.559	15.1	23.53
.578	15.3	23.42
1907.55	15.2	23.46

The principal star is only yellowish.
No other measures.

9458. ε *Sagittae.* (5.6...7.9)

R. A. $19^h\,31^m\,51^s$ Decl. + 16° 12′

A and B

1912.430	81°.43	89″.93
.465	81.08	89.92
.485	81.01	89.92
1912.46	81.17	89.92

From the measures of AB by OΣ, Δ and β (1840-1912) the apparent motion of A is:

0″.022 in 78°.4

The star catalogues make this uncertain:

Auwers	0″.013	in	297°.5
Newcomb	0.017	in	75.4
Boss	0.019	in	47.9

It is probable that B is practically fixed; to make certain of this, I have connected a third small star.

A and C (12.5)

1912.430	280°.20	100″.06
.465	280.31	99.28
.487	279.55	99.00
1912.46	280.02	99.45

9461. OΣ (App.) 187. (7.2...7.7)

R. A. $19^h\,31^m\,55^s$ Decl. + 46° 10′

A and B

1911.509	287°.25	64″.20
.526	287.08	64.10
.529	286.85	64.47
1911.52	287.06	64.26

A and C (7.6)

1911.509	255°.07	128″.97
.526	254.75	128.63
.529	255.00	129.12
1911.52	254.94	128.91

At least two of these three nearly equal stars have some proper motion. Faint stars should be connected with the brighter ones.

9470. H 1423. (6.5...11.2)

R. A. $19^h 32^m 22^s$ Decl. + 29° 5′

1912.296	128°.2	20″.81
.351	128.8	20.58
.353	127.8	20.89
1912.33	128.3	20.76

The only prior measure is my own in 1900. The place of this star is correctly given in Part I of the *General Catalogue*, but wrongly called 9 *Cygni*. It is DM (29°) 3670. 9 *Cygni*, about $2^m 20^s$ preceding H 1423, has a small and uncertain proper motion:

Auwers	0″.021	in	158°.5
Boss	0.025	in	43.4

9485. *θ Cygni.* β 1131. (5.0...14.3)

R. A. $19^h 33^m 13^s$ Decl. + 49° 56′

A and C (11.0)

1909.266	182°.9	44″.58
.342	182.6	44.80
.381	182.5	44.85
1909.33	182.7	44.74

From the measures of C (1852-1905) I have shown that the motion of *θ Cygni* is:

0″.272 in 355°.3

Other values of the proper motion are:

Auwers	0″.244	in	351°.8
Paris	0.241	in	354.5
Newcomb	0.252	in	354.9
Boss	0.249	in	353.5

9486. *σ Aquilae.* H 2886. (5.2...12.0)

R. A. $19^h 33^m 13^s$ Decl. + 5° 7′

1912.430	327°.93	47″.28
.465	328.16	48.12
.487	327.33	48.34
1912.46	327.81	47.91

The only other measure is that given in the *General Catalogue*. The proper motion, if any, is very uncertain. The measures of the faint star should be continued.

Auwers	0″.027	in	278°.5
Newcomb	0.004	in	180.0
Boss	0.001	in	270.0

9493. H 893. (9.2...9.4)

R. A. $19^h 33^m 46^s$ Decl. + 9° 56′

1907.351	192°.7	7″.65
.463	192.4	7.80
.485	192.7	7.83
1907.43	192.6	7.76

Distance larger in the measures of 1894. The apparent change should be confirmed by later measures.

9495. H 1427. (10.5...10.7)

R. A. $19^h 33^m 51^s$ Decl. + 46° 2′

1911.509	290°.3	9″.55
.526	287.1	8.53
.529	285.3	8.41
1911.52	287.6	8.83

About 15′ *nf* H 1427 is *h* 2044 which Herschel describes as a "fine cluster of perhaps 100 stars." No other measures of H 1427.

9504. 45 *Aquilae.* H 2888. (5.8...13.7)

R. A. $19^h 34^m 33^s$ Decl. — 0° 54′

1912.545	353°.9	42″.12
.562	355.0	42.16
.564	353.7	41.81
1912.55	354.2	42.03

The measures of the faint star are too recent to give a reliable value for the proper motion of 45 *Aquilae*. The meridian positions leave this very uncertain:

Auwers	0″.014	in	328°.0
Boss	0.023	in	64.5

9522. Σ 2561 *rej.* (7.9...10.6)

R. A. $19^h 35^m 57^s$ Decl. + 26° 51′

1910.395	309°.8	17″.51
.436	309.8	17.24
.452	310.6	17.33
1910.43	310.1	17.36

The earliest measure of this is on a single night. One of Marth's nebulae is about 15′ distant *np*.

Nebula and DM (27°) 3459 (9.1)

1910.436	313°.8	141″.81
.452	313.4	141.41
1910.44	313.6	141.61

This has been previously measured.

1890.66	313°.0	141″.50	2n	Kobold.

The nebula might be a group of very faint stars. The nucleus, or faint star, has a small companion, 152° : 3″, and a 13 m star more distant.

Nebula (nucleus) and star 13 m

1910.436	351°.0	25″.58

This appears to have been measured from some other part of the nebula:

1890.76	340°.5	6″.73	1n	Kobold.

9531. χ *Aquilae.* OΣ 380. (7.0...7.2)

R. A. 19h 36m 55s Decl. + 11° 33′

AB and C (13.0)

1912.430	48°.53	81″.41
.465	47.98	81.63
.487	48.27	81.92
1912.46	48.29	81.65

For the proper motion of the close pair. This does not appear from the meridian positions:

Auwers	0″.031	in	302°.7
Boss	0.013	in	180.0

9560. 16 *Cygni.* Σ 46, App. I. (5.1...5.3)

R. A. 19h 38m 38s Decl. + 50° 15′

1909.438	134°.90	38″.52
.455	134.95	38.16
.458	134.78	38.51
1909.45	134.88	38.40

The large stars have nearly the same proper motion, and make a system of the 61 *Cygni* class.

A	Auwers	0″.228	in	229°.2
	Paris	0.263	in	228.8
	Porter	0.222	in	227.9
B	Auwers	0.199	in	220.2
	A. G. Harv.	0.161	in	228.5

h 2050 and star 9.5 m

1909.458	194°.08	96″.11
.476	194.09	95.65
.493	194.18	96.31
1909.48	194.12	96.02

This is 2m 55s directly following 16 *Cygni.* The prior measures are:

1876.90	194°.5	97″.9	2n	Wn
1887.79	195.1	96.8	1n	Eng
1891.75	194.2	96.16	2n	β

9582. OΣ 384. (7.0...7.3)

R. A. 19h 39m 32s Decl. + 38° 2′

A and C (9.4)

1909.496	297°.0	58″.94
.512	297.5	59.31
.515	296.9	59.46
1909.51	297.1	59.24

The only other measure is:

1856.83	298°.1	58″.50	1n	Se.

9601. Da 13. (7.2...11.4)

R. A. 19h 40m 58s Decl. + 44° 38′

A and C (10.7)

1909.340	289°.58	153″.45
.342	289.55	153.07
.381	289.70	153.56
1909.35	289.61	153.36

Near δ *Cygni.* The other measures are:

1877.85	289°.75	153″.39	1n	Bl
1879.37	289.82	152.39	1n	Bl.

9607. Σ 2578. (6.6...7.4)

R. A. 19h 41m 15s Decl. + 35° 48′

A and C (12.0)

1908.463	357°.53	45″.45
.479	357.60	45.42
.482	357.87	45.61
1908.47	357.67	45.49

The only other measures are those given in the *General Catalogue* by Glasenapp.

A and D (9.5)

1908.463	251°.28	143″.35
.479	251.20	143.35
.482	251.30	143.26
1908.47	251.26	143.32

Of this we have:

1880.10	251°.32	142″.85	2n	Bl

The apparent change in the distances of both stars requires confirmation.

There is a 14 m star near C, 75°.0: 11″.6.

9617. 17 *Cygni.* Σ 2580. (5.1...8.1)

R. A. 19h 41m 52s Decl. + 33° 27′

A and C (9.0)

1908.266	139°.55	141″.41
.288	139.88	141.47
.331	139.63	141.20
1908.29	139.69	141.36

A and B make Σ 2580, and appear to form a system of the 61 *Cygni* type. There are many stars in the field. We have the following measures of AC:

1852.71	145°.48	161″.68	3n	OΣ
1859.63	144.93	159.01	1n	OΣ
1883.48	142.75	150.11	1n	HΣ
1887.81	142.08	148.81	2n	Eng
1908.29	139.69	141.36	3n	β

From these positions the proper motion of 17 *Cygni* is:

0″.456 in 179°.7

From meridian observations:

Auwers	0″.435	in	181°.7
Porter	0.438	in	180.7
Boss	0.452	in	178.6

9626. H 1439. (7.4...9.1)

R. A. $19^h\ 42^m\ 23^s$ Decl. + 55° 33′

1907.312	200°.5	32″.61
.329	200.1	32.70
1907.32	200.3	32.65

No early measures.

9652. A. G. 238. (9.1...9.2)

R. A. $19^h\ 44^m\ 25^s$ Decl. + 6° 55′

1907.463	273°.0	5″.65
.482	274.6	5.86
.485	273.8	5.67
1907.48	273.8	5.73

The position-angle of 1894 is too large.

9677. 19 *Cygni.* H 603. (6.0...10.0)

R. A. $19^h\ 46^m\ 19^s$ Decl. + 38° 25′

A and B

1907.312	103°.97	54″.01
.329	104.47	54.48
.331	104.27	53.91
1907.32	104.24	54.13

B and C (11.7)

1907.312	11°.7	21″.42
.329	11.1	21.50
1907.32	11.4	21.46

From a mean of my two sets of measures, and a mean of the two positions by Engelhardt, the proper motion of the principal star is:

Measures of B	0″.103	in	170°.7
Auwers	0.112	in	3.6
Bossert	0.110	in	6.1
Boss	0.098	in	6.2

The measures of C do not show any motion in B, but later observations will make this certain.

9683. A. G. 240. (8.8...8.8)

R. A. $19^h\ 46^m\ 35^s$ Decl. + 47° 30′

1907.444	256°.5	14″.50
.465	256.0	14.52
1907.45	256.2	14.51

9689. OΣ 389. (6.9...13)

R. A. $19^h\ 46^m\ 58^s$ Decl. + 30° 50′

A and B

1906.906	307°.5	9″.89
6.964	307.6	10.00
7.312	307.4	9.81
1907.06	307.5	9.90

A and C (8.8)

1907.271	184°.5	12″.62
.312	184.2	12.53
1907.29	184.3	12.57

The nearest companion, 13 m, was added by Espin in 1906. No change in AC.

9691. H 1447. (7.9...10.9)

R. A. $19^h\ 47^m\ 9^s$ Decl. + 33° 46′

A and B

1907.312	333°.9	18″.39
.465	333.8	18.29
.482	334.6	18.22
1907.42	334.1	18.30

A and C (11.3)

1907.312	86°.2	22″.05
.465	85.4	22.31
.482	85.7	22.16
1907.42	85.8	22.17

No early measures.

9716. H 1449. (9.0...12.2)

R. A. $19^h\ 48^m\ 39^s$ Decl. + 32° 44′

1910.263	280°.1	7″.63
.473	282.8	7.29
.490	282.6	7.28
1910.41	281.8	7.40

Two other similar pairs in the field. *h* 2052 is $2^m\ 50^s$ preceding H 1449.

9724. β *Aquilae.* OΣ 532. (3.8...11.3)

R. A. $19^h\ 49^m\ 25^s$ Decl. + 6° 6′

A and C (10.0)

1907.711	348°.00	166″.00
.714	347.70	166.20
.731	348.03	166.53
1907.72	347.91	166.24

The prior measure is:

1879.38	347°.13	151″.89	3n	β^s

These measures give for the proper motion of β *Aquilae:*

0″.512 in 176°.1

From some of the star catalogues we have :

Auwers	0″.474	in	177°.8
Bossert	0.470	in	178.2
Newcomb	0.482	in	175.7
Boss	0.484	in	175.9

The relative motion in AB is very slow.

9756. Σ 2602. (8.5...9.2)

R. A. 19^h 49^m 34^s Decl. — 13° 40′

1908.537	148°.3	12″.27
.559	148.7	12.30
.573	148.4	12.38
1908.56	148.5	12.32

Struve's place of Σ 2602 in *Pos. Med.* belongs to another star 2^m 40^s *f*, SD (13°) 5537, while Σ 2602 is No. 5522. The place in Part I of the *General Catalogue* should be as given here.

It is a coincidence worth mentioning that the star given in *Pos. Med.* is a pair very much like the other except in magnitudes:

A and B (9.0...13.0)

1908.537	156°.5	14″.72
.573	158.0	14.77
.575	158.5	14.87
1908.56	157.7	14.79

No other measures.

A and SD (13°) 5536

1908.520	192°.23	131″.64
.537	192.40	131.89
.559	192.47	131.42
1908.54	192.37	131.65

It is evident that neither of these stars has any proper motion:

1864.77	192°.05	131″.26	1n	Δ.

9765. ψ *Cygni.* Σ 2605. (5.0...7.5)

R. A. 19^h 52^m 32^s Decl. + 52° 7′

A and C (13.8)

1908.425	55°.6	18″.65
.444	54.0	19.11
.460	54.3	18.76
1908.44	54.6	18.84

This faint companion has not been previously seen.

A and D (10.4)

1908.422	61°.38	165″.24
.425	61.30	165.21
.444	61.30	165.64
1908.43	61.33	165.36

Of the distant star we have:

1880.14	61°.50	163″.20	2n	Bl

The two positions give for the apparent motion of A:

0″.078 in 229°.0

Further measures are required to improve the value previously given.

Auwers	0″.059	in	233°.8
Boss	0.051	in	232.6

9775. OΣ 391 *rej.* (7.5...10.2)

R. A. 19^h 52^m 58^s Decl. + 43° 56′

1909.342	51°.6	17″.88
.381	52.0	17.69
1909.36	51.8	17.78

No change since 1866. In Part I of the *General Catalogue for* DM (43°) 3425 *read* 3422; and R. A. should be 22^s less.

9856. Ho 118. (9.1...11.0)

R. A. 19^h 58^m 7^s Decl. + 33° 20′

1909.458	29°.5	2″.71
.476	29.5	2.51
1909.47	29.5	2.61

h 2062 is about 15′ distant *sp;* faint and small, but bisection fairly certain.

h 2062 and star 12.5 m

1909.458	52°.1	36″.63
.476	49.4	36.20
1909.47	50.7	36.41

h 2062 and star 10.3 m

1909.458	240°.5	40″.56
.476	238.5	40.60
1909.47	239.5	40.58

In his observations of nebulae, Engelhardt has compared these stars by differences of R. A. and Decl., and therefore the apparent change is not to be taken as real.

1887.78	54°.2	39″.3	1n	Eng (II)
1887.78	240.5	42.6	1n	Eng (II)

9863. Σ 2622. (8.0...8.7)

R. A. 19^h 58^m 42^s Decl. + 16° 40′

A and C (10.5)

1908.520	308°.1	17″.18
.537	308.8	16.95
.559	308.9	17.35
1908.54	308.6	17.16

No certain change.

9882. H 1471. (5.9...11.5)

R. A. $19^h\ 59^m\ 54^s$ Decl. + 31° 53′

1907.312	6°.2	30″.11
.329	6.9	30.36
.463	6.5	30.30
1907.37	6.5	30.26

No early measures. The proper motion, if any, is very small:

Boss	0″.012	in	186°.1

9903. H 1479. (7.7...10.0)

R. A. $20^h\ 0^m\ 47^s$ Decl. + 25° 15′

1911.583	2°.2	33″.83
.644	2.2	33.58
.663	2.2	33.95
1911.61	2.2	33.79

No early measures.

9905. H 1477. (8.0...10.6)

R. A. $20^h\ 0^m\ 55^s$ Decl. + 12° 20′

1911.583	270°.5	19″.91
.602	271.2	20.23
.625	270.5	19.99
1911.60	270.7	20.04

The only other measures are of recent date.

9911. H 904. (8.8...10.4)

R. A. $20^h\ 1^m\ 14^s$ Decl. + 10° 14′

1907.523	317°.9	27″.60
.578	317.7	27.33
.581	318.2	27.35
1907.56	317.9	27.43

No other measures.

9935. Σ 2640. (6.0...9.9)

R. A. $20^h\ 3^m\ 14^s$ Decl. + 63° 33′

A and C (10.8)

1909.455	81°.31	153″.16
.493	81.20	153.52
.496	81.17	153.65
1909.48	81.23	153.44

The proper motion of A is evidently very small and uncertain:

1880.80	81°.28	153″.40	3n	Bl.

From meridian positions:

Boss	0″.048	in	15°.4
Greenwich	0.052	in	15.7

9944. Σ 2642. (8.7...8.7)

R. A. $20^h\ 3^m\ 57^s$ Decl. +63° 21′

AB and C (12.4)

1912.296	38°.55	90″.94
.351	39.13	90.97
.353	39.51	90.98
1912.33	39.06	90.96

No other measures of C. The close pair appears to be a system of the 61 *Cygni* type. The proper motion is given in the *General Catalogue:*

Stumpe	0″.247	in	51°.5
Porter	0.256	in	50.4

9949. Σ 2634. (8.0...9.5)

R. A. $20^h\ 4^m\ 6^s$ Decl. + 16° 27′

A and B

1911.356	13°.6	5″.48
.392	13.8	5.67
.395	14.2	5.51
1911.38	13.9	5.55

A and C (12.9)

1911.356	313°.90	76″.84
.392	313.50	76.17
.395	313.70	76.32
1911.38	313.70	76.44

C for proper motion of AB. This is given from meridian positions:

A. G. Ber.	0″.184	in	357°.3

The Harvard stellar nebula, Dreyer 6879, is about 15′ distant *nf*. It has a diameter of 3″.7, and resembles a star of 10.7 magnitude out of focus.

Nebula and star (10.7...10.7)

1911.392	221°.74	84″.63
.395	221.90	84.98
1911.39	221.82	84.80

9950. Σ 2635. (7.0...10.5)

R. A. $20^h\ 4^m\ 19^s$ Decl. + 8° 6′

A and C (12.8)

1911.545	43°.05	71″.67
.548	42.90	71.61
.564	42.97	71.65
1911.55	42.97	71.64

No other measures of C. A and B have a common proper motion:

Glasgow	0″.179	in	211°.5
Paris	0.220	in	199.7
Porter	0.210	in	208.3

9965. H 2936. (8.8...9.1)

R. A. $20^h 5^m 19^s$ Decl. + 58° 47′

1908.575	252°0	12″53
.633	252.1	12.60
.636	252.0	12.73
1908.61	252.0	12.62

No other measures.

9997. Espin 132. (8.8...9.0)

R. A. $20^h 7^m 12^s$ Decl. + 56° 36′

A and B

1907.638	82°4	5″45
8.252	83.5	5.79
8.370	81.3	5.51
1908.09	82.4	5.58

A and C (8.6)

1907.638	60°5	37″70
8.252	59.9	37.79
8.370	60.6	37.53
1908.09	60.3	37.67

B and C

1907.638	57°0	32″50
8.252	56.4	32.65
8.370	57.0	32.49
1908.09	56.8	32.55

The only other measures are given in Part I of the *General Catalogue*.

10005. Σ 2649. (7.7...8.8)

R. A. $20^h 7^m 34^s$ Decl. + 31° 43′

A and C (10.3)

1910.608	283°97	129″27
.627	284.10	129.21
.660	284.15	128.97
1910.63	284.07	129.15

Presumably the proper motion of about 0″03 is in A. This will appear from later measures of C.

10007½. Lalande 38760. (7.1...9.6)

R. A. $20^h 7^m 49^s$ Decl. — 1° 14′

A and B

1907.523	82°1	63″91
.562	81.9	64.84
.578	81.7	64.28
1907.55	81.9	64.34
1908.575	82°28	64″92
.594	82.18	64.68
.597	82.58	64.57
.613	82.30	64.54
1908.59	82.33	64.68
1911.411	82°76	64″43
.433	82.48	64.61
.449	82.60	64.34
1911.43	82.61	64.46

B and C (11.0)

1908.594	65°90	25″73
.597	66.88	25.45
.613	66.15	25.69
1908.60	66.31	25.62
1911.433	66°82	25″26
.449	66.17	25.35
.471	66.63	25.39
1911.45	66.54	25.33

The brightness of B seems to have been greatly over-estimated in 1901. I have connected with it a faint star. These are all the measures of BC.

We have for the proper motion of A:

Measures	0″272	in	340°4
Radcliffe	0.262	in	336.7
Paris	0.268	in	327.9
Porter	0.220	in	332.4

The measures of AB should be continued.

10009. Σ 2646. (7.0...8.8)

R. A. $20^h 8^m 1^s$ Decl. — 6° 25′

A and B

1909.666	46°8	21″66
.703	46.6	21.78
.706	46.8	21.54
1909.69	46.7	21.66

From the five positions by Σ, Δ, Hl and β (1829-1909), the proper motion of A is:

0″044 in 81°5

Although it is practically certain that B is fixed, I have measured a third star.

B and C (12.0)

1909.666	106°1	26″42
.703	107.1	26.58
.706	106.0	26.42
1909.69	106.4	26.47

10022. Σ 2655. (7.5...7.5)

R. A. $20^h 8^m 50^s$ Decl. + 21° 52′

A and DM (21°) 4110 (9.2)

1910.529	152°60	59″18
.548	152.90	59.10
.551	153.00	59.68
1910.54	152.83	59.32

The only other measure of this is by South:

1825.65	150°2	57″32	3n	S

As he calls it very difficult, and the distances differ 1″4, there is probably no change.

10033. 3 *Capricorni.* β 294. (5.7...14.0)

R. A. $20^h 9^m 44^s$ Decl. — 12° 42′

A and B

1912.678	34°.6	26″.94
.695	34.0	26.98
.698	36.1	26.89
1912.69	34.9	26.94

From the three positions by A and β (1891-1912) the proper motion of 3 *Capricorni* is:

0″.030 in 117°.7

Further measures of the faint star will reduce the error in the value given. The meridian positions make the components of the movement very uncertain:

Auwers	0″.020	in	275°.6
Boss	0.015	in	169.0

10040. β 983. (6.1...10.2)

R. A. $20^h 10^m 11^s$ Decl. + 25° 14′

A and C (12.0)

1912.581	83°.20	115″.24
.583	83.17	115.87
.619	82.83	116.35
1912.59	83.07	115.82

For the proper motion of the close pair. No other measures. The only proper motion found for the large star in the star catalogues is:

Boss 0″.003 in 233°.6

10044. Σ 2658. (7.0...9.1)

R. A. $20^h 10^m 29^s$ Decl. + 52° 45′

A and B

1911.449	115°.4	5″.77
.471	116.9	5.36
.487	114.8	5.65
1911.47	115.7	5.59

A and C (10.2)

1911.449	209°.38	46″.08
.471	210.00	46.10
.487	209.80	46.25
1911.47	209.73	46.14

From the measures of AC on 15 n by Σ, Δ, Hu and β (1832-1911) the proper motion of A is:

0″.187 in 13°.8

The apparent motion of A from the measures of AB on 20 n by Σ, Δ, Hl, Hu and β (1831-1911) is:

0″.013 in 213°.8

Therefore the real motion of B is:

0″.175 in 12°.3

A system of the 61 *Cygni* type.

Some of the determinations of the proper motion of A from meridian positions are:

Groombridge	0″.175	in	16°.6
Porter	0.152	in	8.2
A. G. Harv.	0.169	in	15.0
Bossert	0.166	in	15.8

10048. H 2944. (8.4...11.8)

R. A. $20^h 10^m 39^s$ Decl. + 60° 1′

1911.375	191°.2	25″.25
.392	190.5	25.57
.395	190.9	25.21
1911.39	190.9	25.34

No other measures.

10054. α^1 *Capricorni.* H 607. (4.5...9.0)

R. A. $20^h 11^m 0^s$ Decl. — 12° 53′

A and C

1911.468	221°.35	45″.01
.471	220.90	45.18
.509	222.03	44.72
.529	221.05	44.99
1911.49	221.78	44.97

Comparing this with my measures in 1879, we have for the proper motion of α^1 *Capricorni:*

0″.025 in 74°.5

Some of the values from meridian positions are:

Auwers	0″.014	in	328°.4
Newcomb (Stand.)	0.005	in	48.7
Newcomb (F. C.)	0.014	in	69.1
Boss	0.016	in	67.7

The measures of both companions should be continued.

10057. α^2 *Capricorni.*

R. A. $20^h 11^m 24^s$ Decl. — 12° 55′

A and D (10.7)

1909.512	156°.92	154″.67
.515	156.97	155.16
.531	156.83	154.76
1909.52	156.91	154.86

From this and the β measure of 1879, the proper motion of the large star is:

0″.053 in 50°.6

This from meridian positions is given:

Auwers	0″.040	in	71°.1
Boss	0.059	in	85.1
Newcomb	0.045	in	89.6

The measures of the faint star should be continued.

10061. A. G. 251. (8.6...10.0)

R. A. $20^h\ 11^m\ 51^s$ Decl. + 5° 49′

1908.575	185°.4	7″.20
.597	185.0	7.25
.633	186.0	7.30
1908.60	185.5	7.25

No evidence of motion. The distance given in G. C. Part I is much too large.

10064. Ho 588. (6.5...8.3)

R. A. $20^h\ 12^m\ 7^s$ Decl. + 31° 8′

A and B

1907.523	297°.32	50″.96
.597	297.13	50.84
.638	297.28	50.94
1907.59	297.24	50.91

B and C (12.0)

1907.523	17°.9	8″.79
.597	17.5	8.60
.638	15.2	8.74
1907.59	16.9	8.71

Early measures discordant.

10077. β 661. (5.7...12.4)

R. A. $20^h\ 12^m\ 39^s$ Decl. + 40° 0′

A and B

1912.583	64°.9	12″.85
.638	65.3	12.68
1912.61	65.1	12.76

There may be a little diminution in the angle since 1878. As the proper motion of the bright star is doubtful, I have connected a faint star.

A and C (13.3)

1912.583	218°.07	111″.42
.638	217.10	112.04
1912.61	217.58	111.73

Auwers	0″.068	in	98°.5
Boss	0.012	in	169.2
Kustner	0.022	in	113.5

10085. *κ Cephei.* Σ 2675. (4.0...8.0)

R. A. $20^h\ 12^m\ 56^s$ Decl. + 77° 21′

A and C (10.1)

1912.255	336°.60	169″.32
.274	336.63	169.48
.296	336.55	169.41
1912.27	336.59	169.40

The small star appears to be DM (77°) 763 (9.5).

From the Astrographic Catalogue, using scale value of 300″.0, we have:

1895 336°.3 170″.1 Greenwich

The proper motion of *κ Cephei* is given:

Auwers	0″.018	in	24°.3
Newcomb	0.027	in	17.7
Boss	0.029	in	25.5

10100. Σ 2666. (6.5...8.7)

R. A. $20^h\ 13^m\ 52^s$ Decl. + 40° 21′

A and C (9.2)

1908.537	207°.6	34″.22
.556	208.0	34.30
.559	206.8	34.44
1908.55	207.5	34.32

The distance by Tarrant is too small.

1894.59 207°.4 34″.27 2n Gla

The proper motion, if any, of the large star is small:

Boss 0″.012 in 162°.7

10104. ν *Capricorni.* (4.9...11.7)

R. A. $20^h\ 14^m\ 0^s$ Decl. — 13° 8′

1908.537	209°.78	53″.90
.573	210.25	54.24
.575	209.80	54.22
.594	210.18	53.61
1908.57	210.00	53.99
1911.471	209°.63	54″.15
.509	210.07	54.21
.529	209.63	53.89
1911.50	209.78	54.08

The four positions by β on 10 n (1877-1911) give for the proper motion of ν *Capricorni:*

0″.042 in 216°.8

Further measures should be made, as the first of these is on a single night.

The meridian positions leave the amount and direction of the movement uncertain:

Auwers	0″.024	in	257°.9
Boss	0.018	in	156.7
Newcomb	0.014	in	266.8

10133. Arg. 38. (9.8...10.0)

R. A. $20^h\ 15^m\ 25^s$ Decl. — 20° 37′

1906.755	272°.8	17″.30
7.675	273.7	17.45
7.695	273.8	17.43
1907.37	273.4	17.39

Probably without change.

10135. Σ 2671. (6.0...7.4)

R. A. $20^h 15^m 27^s$ Decl. + 55° 1′

A and C (12.8)

1911.375	54°.10	84″.40
.392	55.87	83.50
.395	54.90	83.73
1911.39	54.96	83.88

For the proper motion of AB. C has a very faint companion.

C and D (14.1)

1911.395	120°.9	5″.50
.414	114.6	5.27
.471	120.4	5.46
1911.43	118.6	5.41

The proper motion of A is small:

Groombridge	0″.032	in	204°.1
Boss	0.021	in	199.0

10137. H 2954. (9.5...9.5)

R. A. $20^h 15^m 30^s$ Decl. + 19° 25′

1909.381	302°.7	2″.48
.400	305.3	2.97
1909.39	304.0	2.72

About ½° *nf* H 2954 is *h* 2075. The central star, from which the measures are made, is faint and difficult. This is Dreyer 6905.

h 2075 and star 11.9 m

1909.381	162°.9	36″.89
.400	164.0	36.83
1909.39	163.4	36.86

h 2075 and star 10.0 m

1909.381	358°.2	46″.77
.400	359.0	46.16
1909.39	358.6	46.46

The last was measured at the Lick Observatory:

1891.60	357°.6	46″.68	2n	β

10144. Ho 456. (8.0...13.0)

R. A. $20^h 16^m 18^s$ Decl. — 27° 7′

1906.755	210°.4	14″.07
7.695	211.4	14.39
1907.22	210.9	14.23

Probably unchanged.

10162. H 1505. (8.3...10.9)

R. A. $20^h 17^m 10^s$ Decl. + 43° 12′

1907.463	109°.6	17″.14
.465	109.9	16.87
.482	109.8	17.13
1907.47	109.8	17.05

No early measures.

10168. γ *Cygni.* β 665. (2.2...10.5)

R. A. $20^h 17^m 55^s$ Decl. + 39° 52′

A and BC

1911.414	196°.18	141″.49
.430	196.38	141.48
.449	196.25	141.13
.471	196.18	141.20
1911.44	196.25	141.33

From the four positions of the small star (1878-1911) we have for the proper motion of γ *Cygni:*

0″.034 in 338°.4 .

The proper motion given in Part II of the *General Catalogue* belongs to another star. The several results derived from meridian observations are contradictory and uncertain.

Auwers (F. C.)	0″.019	in	356°.5
Auwers (cor'd)	0.008	in	321.0
Newcomb (Stand.)	0.022	in	108.4
Newcomb (F. C.)	0.004	in	80.1
Boss	0.003	in	159.0

While it is practically certain that there is no motion in BC which would affect the value given, I have connected a very faint star:

BC and D (12.8)

1911.449	134°.73	40″.76
.471	133.63	40.98
.487	133.85	40.99
1911.47	134.07	40.91

10171. H 1510. (8.5...8.8)

R. A. $20^h 18^m 31^s$ Decl. + 47° 23′

A and B

1908.573	150°.2	4″.65
8.575	150.4	4.51
8.594	149.9	4.52
9.400	148.8	4.45
9.438	150.3	4.54
1908.92	149.9	4.53

A and C (12.6)

1908.573	341°.7	6″.70
8.575	342.2	6.53
8.594	343.0	6.46
9.400	340.6	6.37
1908.78	341.9	6.51

A and D (11.2)

1908.573	323°.3	31″.32
.575	322.3	31.24
.594	322.1	31.08
1908.58	322.6	31.21

H 1511 is in the field.

H 1510 and H 1511

1909.400	121°.05	57″.24
.438	120.90	57.37
1909.42	120.97	57.30

10177. H 1511. (11.1...11.5)

R. A. $20^h\ 18^m\ 38^s$ Decl. + 47° 23′

1909.400	239°.6	10″.67
.438	241.0	10.60
1909.42	240.3	10.63

No other measures.

10180. OΣ (App.) 207.

R. A. $20^h\ 18^m\ 47^s$ Decl. + 42° 36′

A and C (6.5...7.7)

1908.537	63°.33	94″.02
.556	63.32	94.00
.573	63.43	93.73
1908.56	63.36	93.92

In G. C. Part II, p. 1082, in the proper motion of A, *for* 1″.086 *read* 0″.086.

The four sets of measures of C now available (1876-1908) give for this motion:

0″.083 in 53°.6

From meridian positions:

Kustner 0″.061 in 56°.2

While C is a bright star, there is no reason for supposing that it has any sensible proper motion. For greater certainty, I have measured the faint star D.

C and D (13.3)

1908.537	162°.24	57″.51
.556	164.37	57.60
.573	163.80	57.20
1908.56	163.47	57.44

10182. Σ 2679. (7.4...8.7)

R. A. $20^h\ 18^m\ 59^s$ Decl. + 19° 11′

A and B

1910.490	78°.55	22″.94
.493	78.22	22.96
.509	77.63	22.72
1910.50	78.13	22.87

A and C (10.1)

1910.490	152°.15	38″.90
.493	152.38	38.71
.509	151.40	39.02
1910.50	151.98	38.88

No other measures of C. About 40′ *np* is the interesting object, *h* 2075. This was measured at the Lick Observatory; central star not seen here. (*Pub. L. O.* II p. 166.)

10183. Lewis 34. (10.4...10.6)

R. A. $20^h\ 19^m$ ± Decl. + 42° 45′ ±

1908.537	174°.9	4″.40
.556	175.9	4.44
.573	173.8	4.43
1908.56	174.9	4.42

These stars, too faint to be in the DM, are about 6′ *n* of the 8.7 m star, DM (42°) 3725. This does not agree with the description by Lewis in magnitudes, or distance which is given as 1″.55. As nothing else could be found in this vicinity, there must be a large error in the place, or in the measures.

10189. Σ 2680. (8.3...8.5)

R. A. $20^h\ 19^m\ 14^s$ Decl. + 14° 29′

1906.755	288°.0	15″.90
7.465	288.2	16.11
7.482	288.0	16.17
1907.23	288.1	16.06

No relative motion.

10194. β 1134. (5.8...12.7)

R. A. $20^h\ 19^m\ 29^s$ Decl. + 63° 36′

1907.463	80°.0	4″.23
8.482	80.0	4.09
8.520	80.6	4.34
1908.15	80.2	4.22

The only other measures are my own in 1889.

I do not find any proper motion given the large star; not in Boss or Groombridge.

10196. Σ 2681. (7.3...10.8)

R. A. $20^h\ 19^m\ 35^s$ Decl. + 53° 2′

A and B

1910.548	41°.0	6″.57
.551	40.1	6.37
1910.55	40.5	6.47

A and C (8.0)

1910.548	201°.80	40″.20
.551	201.65	40.02
.570	201.70	40.40
1910.56	201.72	40.21

C and D (11.0)

1910.548	101°.53	22″.50
.551	101.98	22.53
.570	101.73	22.88
1910.56	101.75	22.64

It is evident from the measures of CD that D has no proper motion. The measures of AC by Σ, Δ and β (1831-1910) give for the proper motion of AB:

0″.029 in 119°.1

10199. H 1513. (8.4...11.5)

R. A. $20^h\ 19^m\ 48^s$ Decl. + 46° 8′

1910.512	326°.1	13″.87
.529	327.6	13.69
.548	326.3	13.97
1910.53	326.7	13.84

No other measures.

10216. S 749. (7.0...7.4)

R. A. $20^h\ 21^m\ 14^s$ Decl. — 2° 30′

A and C

1908.441	316°.52	43″.56
.479	316.43	43.55
.482	316.48	43.67
.518	316.02	43.73
1908.48	316.36	43.63

C and D (10.6...10.7)

1908.441	240°.25	77″.35
.482	240.50	77.23
.518	239.42	77.06
1908.48	240.06	77.21

There is a 13.5 m star near C, 197°.5 : 19″.8.

A and D

1908.479	266°.23	97″.59
.482	266.33	97.44
.518	266.55	97.11
1908.49	266.37	97.38

D and *d* (13.6)

1908.479	21°.7	5″.78
.482	21.5	5.78
.518	19.1	5.80
1908.49	20.8	5.79

We have the following of two of these stars:

AC	1891.79	314°.02	44″.87	2n	Eng
AD	1891.79	266.25	100.37	1n	Eng

If the early measures had been made on a greater number of nights, the result of a comparison with the present measures would be more accurate.

AC	R. A. — 0″.130	Decl. — 0″.024
AD	0.178	0.024
	— 0.154	— 0.024

Hence the most probable proper motion of A is:

0″.156 in 261°.1

The meridian positions give:

Porter	0″.148	in	245°.3
Boss	0.104	in	230.8

10235. H 1516. (8.0...10.7)

R. A. $20^h\ 22^m\ 26^s$ Decl. + 54° 17′

1907.329	148°.1	47″.17
.348	148.2	47.13
.463	147.7	46.96
1907.38	148.0	47.09

No other measures. A 12.5 m star about the same distance in 204°. A. G. Harvard gives the principal star a proper motion of 0″.031 in 270°.

10240. Ho 131. (7.8...11.2)

R. A. $20^h\ 22^m\ 49^s$ Decl. + 18° 23′

A and C (10.7)

1907.329	81°.25	99″.62
.348	81.39	99.41
.444	80.87	99.77
1907.37	81.17	99.60
1910.490	80°.78	98″.66
.509	80.90	98.65
.529	80.80	98.37
1910.51	80.83	98.56
1912.504	80°.68	98″.11
.507	79.93	97.93
.545	80.87	98.54
1912.52	80.49	98.19

My measures of this (1903-1910) give for the proper motion of A:

0″.380 in 103°.1

The measures should be continued for a final value. From meridian observations:

A. G. Berlin 0″.384 in 109°.3

10264. β 363. (7.0...11.0)

R. A. $20^h\ 24^m\ 28^s$ Decl. + 20° 12′

A and B

1911.373	64°.95	17″.49
.392	64.86	17.49
.395	64.60	17.70
1911.39	64.80	17.56

A and C (11.7)

1911.373	200°.08	45″.62
.392	199.30	45.39
.395	199.45	45.67
1911.39	199.61	45.56

The several measures of both companions should give the proper motion of the principal star with great accuracy.

From the six positions of B on 16 n by Doo and β (1878-1911), and the four positions of C by β on 11 n (1900 to 1911) we have:

	R. A.	Decl.
AB	+ 0″.106	+ 0″.081
AC	0.092	0.087
	+ 0.099	+ 0.084

Therefore the proper motion of A is:

0″.130 in 49°.7

No motion found in the star catalogues.

10289. β 668. (6.2...11.7)

R. A. $20^h\,25^m\,49^s$ Decl. — 10° 16′

A and C

1908.633	198°.23	100″.05
.636	198.40	100.11
.652	198.00	100.54
.671	198.30	100.00
1908.65	198.23	100.18
1911.449	198°.60	100″.72
.468	198.67	100.30
.545	198.70	100.54
1911.49	198.66	100.52

These measures of the 10.4 m star are made in the interest of the large proper motion of AB.

Bonn	0″.309	in	67°.7
Auwers	0.309	in	72.1
Porter	0.305	in	66.2
Paris	0.234	in	61.4
Boss	0.316	in	73.1

10298. ω² *Cygni.* β 669. (5.5...13.5)

R. A. $20^h\,26^m\,20^s$ Decl. + 48° 33′

A and B

1909.570	341°.4	18″.07
.592	339.8	17.87
.666	340.9	18.13
1909.61	340.7	18.02

A and C (10.0)

1909.551	86°.15	56″.20
.570	86.62	56.54
.573	86.35	56.22
1909.56	86.37	56.32

No change in AC, and probably none in AB as the first position depends on a single night. It is therefore probable that the large star has no sensible proper motion. The results from meridian observations are contradictory:

Groombridge	0″.024	in	94°.8
Auwers	0.042	in	160.8
Boss	0.010	in	65.9

10315. ω² *Cygni.* S 756. (5.0...9.7)

R. A. $20^h\,27^m\,36^s$ Decl. + 48° 49′

1912.675	323°.05	57″.34
.678	323.02	57.38
1912.67	323.03	57.36

There are three other stars within this distance from A. Comparing the recent measures of B with the single measure of OΣ in 1840 gives for the proper motion of the large star:

Measures	0″.051	in	201°.5
Auwers	0.042	in	160.9
Boss	0.037	in	164.7

10320. Σ 2697 *rej.* (7.5...9.5)

R. A. $20^h\,28^m\,13^s$ Decl. — 0° 53′

1911.545	1°.7	30″.32
.564	1.3	30.33
.567	1.2	30.57
1911.56	1.4	30.41

The apparent change in distance from the measure of 1848 is probably not real.

10325. H 1535. (8.0...11.6)

R. A. $20^h\,28^m\,32^s$ Decl. + 32° 58′

A and B

1908.537	247°.4	16″.92
.573	246.3	16.77
.575	246.8	17.09
1908.56	246.8	16.93

A and C (11.6)

1908.537	153°.2	18″.54
.573	154.1	18.62
.575	154.2	18.65
1908.56	153.8	18.60

The proper motion given A seems to be doubtful, at least in amount. The distance of B should have increased about 1″ since 1902.

Bakhuyzen 0″.168 in 47°.5

10335. DM (5°) 4556. (8.6...10.5)

R. A. $20^h\,29^m\,14^s$ Decl. + 5° 42′

1908.597	52°.25	57″.90
.633	51.83	57.99
.636	51.50	57.96
1908.62	51.86	57.95

Large proper motion. (See *General Catalogue,* Part II.)

0″.505 in 135°.3

10367. 71 *Aquilae.* β 672. (6.0...12.5)

R. A. 20ʰ 32ᵐ 8ˢ Decl. — 1° 31′

1912.408	281°.2	31″.85
.411	282.5	32.02
.465	283.8	31.90
1912.42	282.5	31.92

If 71 *Aquilae* has any proper motion, it is very uncertain from the meridian observations:

Auwers	0″.005	in	257°.5
Boss	0.028	in	154.4

Further measures of the faint star are necessary to determine the real movement of the large star.

10372. τ *Capricorni.* Hu 200. (5.5...6.8)

R. A. 20ʰ 32ᵐ 34ˢ Decl. — 15° 22′

AB and C (12.3)

1912.507	272°.27	158″.42
.564	272.53	158.22
.583	272.56	159.09
1912.55	272.45	158.58

No other measures. The proper motion of the large star, if any, is very uncertain.

Auwers	0″.021	in	235°.3
Newcomb	0.029	in	176.3
Boss	0.023	in	161.8

10373. 48 *Cygni.* Σ 53, App. I. (6.0...6.1)

R. A. 20ʰ 32ᵐ 39ˢ Decl. + 31° 9′

A and B

1911.280	175°.65	179″.77
.302	175.64	179.74
.334	175.54	179.76
1911.31	175.61	179.76

The four positions by Σ, Δ and β (1835-1911) give for the apparent motion of B with reference to A:

0″.037 in 225°.8

The proper motions from meridian positions are discordant:

A	0″.057	in	238°.5	Auwers
	0.009	in	188.1	Boss
B	0.062	in	216.8	Auwers
	0.069	in	228.2	Boss

For determining hereafter the real motion of A, I have connected a very small star.

A and *a* (12.7)

1911.280	1°.65	71″.33
.302	0.88	70.80
.334	1.47	71.51
1911.31	1.33	71.21

10378. Σ 2705. (7.1...8.1)

R. A. 20ʰ 32ᵐ 57ˢ Decl. + 32° 57′

A and C (11.3)

1909.400	341°.00	182″.73
.458	341.28	183.46
.493	341.15	183.39
1909.45	341.14	183.19

Apparently no proper motion:

1880.15	341°.85	182″.93	2n	Bl

No change in AB.

10383. Hn 39. (8.0...10.8)

R. A. 20ʰ 33ᵐ 7ˢ Decl. + 50° 28′

1908.520	176°.0	7″.62
.537	175.2	7.61
.559	177.4	7.93
1908.54	176.2	7.72

No change since 1881.

10386. 1 *Aquarii.* H 2984. (5.5...11.5)

R. A. 20ʰ 33ᵐ 10ˢ Decl. + 0° 4′

A and B

1909.515	219°.63	57″.96
.534	219.25	58.40
.570	219.35	58.19
1909.54	219.41	58.18

A and C (11.4)

1909.515	36°.65	70″.75
.534	37.24	70.89
.570	37.60	70.99
1909.54	37.16	70.88

From the measures of these two small stars, we have for the proper motion of 1 *Aquarii:*

AB	R. A. + 0″.098	Decl. + 0″.026
AC	0.115	0.006
	+ 0.106	+ 0.016

Measures	0″.107	in	81°.4
Auwers	0.078	in	105.0
Boss	0.094	in	99.2

10390. κ *Delphini.* OΣ 533. (4.7...11.3)

R. A. 20ʰ 33ᵐ 19ˢ Decl. + 9° 40′

1908.671	300°.6	17″.50
.673	300.3	17.43
.689	301.6	17.46
.692	300.2	17.53
1908.68	300.67	17.48

The proper motion of ϰ *Delphini* from the measures of the small star (1852-1904) is given in the *General Catalogue:*

Measures of B	0".312	in	85°.8
Auwers	0.298	in	86.5
Newcomb	0.314	in	87.0
Boss	0.315	in	87.8

10401. α *Delphini.* β 298. (3.9...)

R. A. $20^h 34^m 4^s$ Decl. + 15° 29′

A and B (13.5)

1911.526	225°.2	30".37
.545	223.8	29.98
.564	224.9	30.63
1911.54	224.6	30.33

A and C (12.0)

1911.526	279°.55	43".78
.545	279.50	43.67
.564	279.60	43.88
1911.54	279.55	43.78

A and D (13.0)

1911.526	151°.35	47".14
.545	151.68	47.54
.564	151.43	48.00
1911.54	151.49	47.56

A and E (12.7)

1911.526	308°.12	51".32
.545	307.70	51.77
.564	307.47	51.67
1911.54	307.76	51.59

A and F (10.8)

1911.526	114°.68	79".84
.545	114.93	79.24
.564	114.73	79.17
1911.54	114.78	79.42

From the measures (1877-1911) the annual motion of the large star is:

AB	R. A. + 0".065	Decl. + 0".043
AC	0.057	0.017
AD	0.033	0.006
AE	0.032	0.043
AF	0.053	0.024
	+ 0.048	+ 0.027

Therefore the corrected proper motion of α *Delphini* is:

0".055 in 60°.7

From transit observations:

Auwers	0".046	in	90°.0
Newcomb	0.070	in	76.2
Boss	0.064	in	97.2

10402. Σ 2708. (7.0...8.7)

R. A. $20^h 34^m 7^s$ Decl. + 38° 13′

A and B

1909.512	328°.47	29".65
1911.280	329°.42	30".33
.334	329.00	30.23
.373	329.28	30.05
1911.33	329.23	30.20

From ten positions by Σ, OΣ, Δ, Du, Hl and β on 31 n (1829-1911) the proper motion of the principal star is:

0".256 in 136°.4

A and D (10.3)

1909.458	217°.85	113".42
.493	217.90	113.62
.512	217.57	113.62
1909.49	217.77	113.55

The only other measure is:

1880.08	214°.17	115".07	2n	Bl

The proper motion of the principal star from the measures of D is therefore:

0".245 in 137°.0

From meridian positions:

Porter 0".242 in 138°.7

A and C (13.5)

1911.334	13°.3	16".70
.373	14.0	17.13
.395	13.5	16.79
1911.37	13.6	16.87

From the four measures of C, the proper motion of A is:

0".295 in 130°.2

Of course this should be identical with the result from AB, but when the difficulty of the object, the short time covered by the measures, and the further fact that two of the positions are from a single night, are taken into account, the agreement is all that could be expected.

10426. Σ 2717. (7.2...9.7)

R. A. $20^h 35^m 19^s$ Decl. + 60° 20′

A and C (9.7)

1908.633	52°.83	45".90
.636	53.20	45.65
.652	52.83	45.67
1908.64	52.95	45.74

The only other measure of AC is that of 1898 given in the *General Catalogue.*

10429. H 2987. (10.5...10.7)

R. A. $20^h 35^m 33^s$ Decl. + 19° 36′

1909.573	115°.6	10″.61
.589	116.5	10.63
1909.58	116.0	10.62

No other measures. Other small stars near.

10437. 49 *Cygni.* Σ 2716. (6.0...8.2)

R. A. $20^h 36^m 11^s$ Decl. + 31° 53′

A and C (12.0)

1912.351	91°.83	68″.63
.353	90.86	68.00
.389	91.08	68.26
1912.36	91.26	68.30

No other measures of the small star. The proper motion of 49 *Cygni* is given:

Auwers	0″.018	in	154°.5
Boss	0.018	in	176.0

10441. Ho 595. (7.0...12.2)

R. A. $20^h 36^m 33^s$ Decl. + 22° 33′

1907.638	109°.6	17″.27
.675	111.2	17.64
.731	109.7	17.29
1907.68	110.2	17.40

Probably unchanged.

10443. Hn 40. (8.6...8.9)

R. A. $20^h 36^m 34^s$ Decl. — 19° 55′

A and B

1907.675	356°.0	5″.08
.692	355.7	5.32
.695	357.6	5.14
1907.69	356.4	5.18

C and D (9.1...10.0)

1907.675	187°.7	4″.32
.692	186.0	4.43
.695	189.9	4.27
1907.69	187.9	4.34

A and C

1907.675	257°.7	143″.66
.692	257.7	144.04
.695	257.7	143.92
1907.69	257.7	143.87

No certain change since 1881.

10446. H 2990. (9.6...12.1)

R. A. $20^h 36^m 48^s$ Decl. — 20° 57′

1907.675	308°.9	19″.65
.695	309.7	19.45
1907.68	309.3	19.55

This is SD (21°) 5807 and not SD (20°) as printed in the *General Catalague.* No other measures.

10447. Σ 2718. (7.4...7.6)

R. A. $20^h 36^m 52^s$ Decl. + 12° 18′

A and B

1908.671	86°.5	8″.45
.673	86.9	8.46
.689	86.1	8.95
1908.68	86.5	8.62

A and C (8.0)

1908.671	345°.70	166″.99
.689	345.38	167.07
.692	345.36	167.09
1908.68	345.48	167.05

No change in AC since 1889.

10459. β 674. (8.0...10.8)

R. A. $20^h 37^m 53^s$ Decl. — 21° 19′

1907.788	102°.9	1″.48
7.807	103.8	1.70
8.573	102.7	1.45
1908.06	103.1	1.54

No material change.

10468. H 1566. (12...13)

R. A. $20^h 38^m 12^s$ Decl. + 12° 4′

1909.760	18°.3	15″.17
.782	20.2	15.24
1909.77	19.2	15.20

No other measures. Herschel's estimated angle is 70°.

The declination of H 1566 in Part I of the *General Catalogue* is 5′ too large. *h* 2086 is the object referred to in H (IV).

H 1566 and *h* 2086

1909.760	336°.8	30″.16

10474. H 2992. (9.5...9.7)

R. A. $20^h 38^m 23^s$ Decl.— 20° 50′

1907.675	139°.5	2″.78
.695	136.8	2.59
1907.68	138.1	2.68

Change uncertain.

10476. 51 *Cygni.* β 675. (5.5...13.0)

R. A. 20^{h} 38^{m} 31^{s} Decl. + 49° 54′

A and C (12.0)

1911.602	181°.1	26″.05
.663	184.2	25.81
.698	181.3	26.43
1911.65	182.2	26.10

A and D (12.0)

1911.602	329°.9	33″.40
.663	329.1	33.54
.698	328.6	33.02
1911.65	329.2	33.32

Further measures of C and D are necessary for a safe value of the proper motion of 51 *Cygni.*

From meridian observations this motion is uncertain:

Auwers	0″.031	in	93°.7
Boss	0.007	in	90.0

10477. Arg 39. (8.4...8.6)

R. A. 20^{h} 38^{m} 42^{s} Decl. + 48° 50′

A and B

1909.515	115°.0	9″.52
.534	115.7	9.38
.551	115.4	9.53
1912.296	116.6	9.65
.351	117.6	9.47
.353	117.1	9.38

The mean results are:

1909.53	115°.4	9″.48	3n
1912.33	117.1	9.50	3n

B and C (12.5)

1909.515	124°.8	31″.23
.534	126.5	30.98
.570	126.0	30.61
1912.296	125.4	31.34
.351	125.9	30.98
.353	126.2	31.04

The measures of BC show conclusively that the proper motion is all in the larger star.

1906.52	126°.5	31″.02	2n	β
1909.54	125.8	30.94	3n	β
1912.33	125.8	31.12	3n	β

From the β measures of AB on 16 n (1903 to 1912) we have for the proper motion of the principal star:

0″.132 in 30°.5

10487. β 64. (8.7...9.0)

R. A. 20^{h} 39^{m} 18^{s} Decl. + 12° 17′

AB and C (7.3)

1911.583	157°.25	96″.68
.602	157.60	96.60
.625	157.43	96.38
1911.60	157.43	96.55

AB and *a* (10.6)

1911.583	118°.35	62″.90
.602	118.90	62.60
.625	118.83	62.79
1911.60	118.69	62.76

Perhaps a little change in the angle of both distant stars. The magnitudes of the close components vary from 8.7 and 9.0 (Dembowski) to 7.5 and 7.5 (Aitken).

10512. ε *Cygni.* β 676. (2.5...12.0)

R. A. 20^{h} 41^{m} 21^{s} Decl. + 33° 31′

1908.652	298°.63	40″.88
.655	298.18	41.09
.671	298.25	40.74
.673	298.62	40.69
1908.66	298.42	40.85

The proper motion of ε *Cygni* from nine sets of complete measures (1852 to 1908) is:

0″.504 in 48°.7

From the star catalogues:

Auwers	0″.481	in	46°.5
Boss	0.483	in	48.2
Newcomb	0.491	in	48.5

10525. Hn 41. (8.5...12.3)

R. A. 20^{h} 42^{m} 5^{s} Decl. + 53° 35′

A and B

1908.671	235°.1	3″.55
.673	236.4	3.63
1908.67	235.7	3.59

A and C (11.0)

1908.655	260°.9	8″.26
.671	262.4	8.14
.673	261.4	8.01
1908.67	261.6	8.14

Probably fixed.

10526. H 2998. (9.5...9.6)

R. A. 20^{h} 42^{m} 18^{s} Decl. — 21° 5′

A and B

1907.695	141°.4	5″.80
8.573	140.4	6.18
8.633	141.7	6.09
1908.30	141.2	6.02

A and C (10.6)

1908.633	133°.23	99″.17
.636	133.07	99.04
1908.63	133.15	99.10

The principal star is SD (21°) 5839 (8.7). There is no relative change in AB. To verify the alleged large proper motion, I have connected a third small star.

Porter	0″.400	in	130°.2
Bossert	0.392	in	140.0

10533. λ *Cygni.* OΣ 413. (5.0...6.3)

R. A. $20^h 42^m 44^s$ Decl. + 36° 3′

AB and C (9.3)

1912.427	105°.10	84".88
.430	105.17	84.80
.465	105.15	84.95
1912.44	105.14	84.88

C is DM (35°) 4269. Nothing can be inferred as to the proper motion of the close pair from the meridian positions. Some of the results are:

Auwers (F. C.)	0".022	in	323°.3
Auwers (cor'd)	0.011	in	280.4
Newcomb	0.012	in	118.1
Boss	0.012	in	161.7

From the measures of the small star on 13 n by OΣ and β (1852-1912), the corrected proper motion of λ *Cygni* is:

0".008 in 95°.5

It is at least probable that A and B constitute a system of the 61 *Cygni* type.

10535. η *Cephei.* (3.5...11.2)

R. A. $20^h 42^m 51^s$ Decl. + 61° 22′

1907.329	40°.75	80".37
.348	40.33	80.13
.444	40.28	79.81
1907.37	40.45	80.10

From my four sets of measures (1879 to 1907) the proper motion of η *Cephei* is:

0".814 in 10°.1

The correction to the meridian value is small:

Newcomb	0".825	in	6°.9
Auwers	0.816	in	6.7
Boss	0.826	in	6.7

Later measures:

1910.493	41°.68	78".12
.509	41.30	78.37
.512	41.25	78.07
1910.50	41.41	78.19

10546. 15 *Delphini.* (5.5...13.6)

R. A. $20^h 43^m 55^s$ Decl. + 12° 6′

A and C (10.5)

1908.383	81°.98	108".04
.422	81.70	107.96
.425	81.93	108.11
1908.41	81.87	108.04

The prior measures are:

1886.93	81°.15	109".34	2n	Eng
1894.36	81.39	108.64	2n	Eng

The proper motion of the principal star is:

Measures of C 0".078 in 34°.4

The measures of both companions should be continued. Some of the results of meridian positions are:

Paris	0".122	in	31°.0
Porter	0.113	in	26.0
Auwers	0.106	in	18.6
Boss	0.114	in	32.7

10555. Σ 2731. (7.7...10.8)

R. A. $20^h 44^m 31^s$ Decl. + 39° 21′

A and B

1906.906	88°.5	4".01
.964	88.2	4.10
1906.93	88.3	4.05

A and C (13.2)

1906.906	173°.0	17".36
6.964	175.0	17.11
7.312	171.9	17.20
1907.06	173.3	17.22

A and D (13.2)

1906.906	245°.1	19".25
6.964	244.2	18.88
7.312	245.9	19.55
1907.06	245.1	19.23

The small stars measured because of the singular discordance of the prior results. There is little probability of any real change.

A and C

1895.80	171°.3	16".41	1n	Ho
1904.93	175.2	17.38	1n	Lewis

A and D

1895.80	249°.0	18".53	1n	Ho
1904.93	247.3	14.13	1n	Lewis

10559. 4 *Aquarii.* Σ 2729. (5.9...7.2)

R. A. $20^h 45^m 4^s$ Decl. — 6° 4′

AB and C (13.2)

1912.408	316°.83	68".89
.411	316.07	69.13
.430	316.47	68.10
1912.42	316.46	68.71

AB and SD (6°) 5603 (9.1)

1912.408	328°.25	131".46
.411	328.22	131.26
.430	328.60	131.26
1912.42	328.36	131.33

The proper motion of the binary system is given:

Auwers	0″.064	in	88°.2
Boss	0.090	in	97.0

The only other positions of the SD star are from the star catalogues:

1825	334°.1	125″.9	Weisse
1893	329.5	131.9	A. G. Wein

The orbit of the close pair is wholly uncertain, and likely to remain so for a long time. A difference in the computed periods by the same authority of more than 500 years is evidence on this point. (See *General Catalogue*, p. 912.)

10570. Espin 94. (6.5...9.5)

R. A. $20^h\,45^m\,51^s$ Decl. $+49°\,41'$

A and B

1910.589	13°.02	100″.96
.605	12.93	100.76
.608	12.81	100.87
1910.60	12.92	100.86

B and C (10.0)

1910.589	81°.9	2″.62
.605	79.5	2.39
.608	78.0	2.65
1910.60	79.8	2.55

The principal star has no sensible proper motion:

Groombridge	0″.007	in	261°.5

10577. OΣ (App.) 211. (6.5...7.2)

R. A. $20^h\,46^m\,24^s$ Decl. $+58°\,18'$

1911.545	263°.04	109″.94
.548	262.73	109.36
.564	263.01	109.30
1911.55	262.93	109.53

The change appears to be due wholly to the proper motion of B. The star catalogues give A no sensible movement. These stars are respectively Groombridge 3309 and 3307.

Measures	0″.171	in	61°.4
Groombridge	0.169	in	58.2

10586. H 1588. (9.6...11.6)

R. A. $20^h\,47^m\,17^s$ Decl. $+62°\,30'$

1910.493	33°.8	18″.78
.509	32.0	18.46
.512	32.4	18.43
1910.50	32.7	18.56

No other measures.

10587. Ho 145. (8.7...10.2)

R. A. $20^h\,47^m\,24^s$ Decl. $+34°\,46'$

1907.329	310°.1	9″.00
.351	310.7	8.83
.444	310.4	8.99
1907.37	310.4	8.94

Motion in angle and distance. From the four positions by Ho, Doo and β (1886-1911) the proper motion of A is:

0″.082 in 88°.0

10588. β 155. (6.5...7.4)

R. A. $20^h\,47^m\,24^s$ Decl. $+50°\,58'$

AB and D (11.4)

1909.515	48°.11	198″.24
.534	47.98	198.61
.551	48.01	198.05
1909.53	48.03	198.30

The first measures are uncertain in distance:

1879.96	48°.08	200″.91	In	Bl
1881.43	48.37	198.73	In	Bl

10595. Σ 2734. (8.2...8.7)

R. A. $20^h\,48^m\,21^s$ Decl. $+12°\,39'$

1911.545	199°.6	24″.79
.564	199.8	24.69
.567	199.6	24.50
1911.56	199.7	24.66

I have given the apparent proper motion of A (0″.111 in 125°.2) on the assumption that B is fixed, but as this is 8.7 m it might have some motion of its own. Unfortunately there is no faint star near enough for comparison.

10609. 16 *Delphini.* H 1592. (5.6...12.2)

R. A. $20^h\,49^m\,55^s$ Decl. $+12°\,7'$

1909.496	20°.93	38″.18
.512	20.13	38.14
.515	20.17	38.24
1909.51	20.41	38.19
1911.509	21°.30	37″.91
.526	20.39	38.31
.529	20.03	38.29
1911.52	20.57	38.17

The four β measures on 13 n (1879-1911) give for the proper motion of 16 *Delphini:*

0″.063 in 46°.8

The value derived from meridian positions is too small:

Auwers	0″.024	in	65°.6
Boss	0.044	in	74.3

10616. *7 Aquarii.* β 1034. (6.0...11.7)

R. A. $20^h 50^m 25^s$ Decl. — 10° 9′

A and C (9.5)

1912.507	66°.50	176″.71
.564	66.60	176.46
.583	66.65	176.47
1912.55	66.58	176.55

For the proper motion of A. No other measures.

Auwers	0″.033	in	257°.8
Newcomb	0.010	in	238.2
Boss	0.020	in	226.5

10621. Ho 460. (6.9...12.6)

R. A. $20^h 50^m 54^s$ Decl. + 27° 7′

A and B

1911.487	87°.4	12″.78
.564	85.9	12.33
.602	88.3	12.51
1911.55	87.2	12.54

A and C (13.0)

1911.487	260°.7	35″.58
.564	260.2	35.67
.602	259.9	35.57
1911.55	260.3	35.61

No certain change in AB. The only other complete measures of the faint star are:

1906.59	261°.3	35″.67	3n	Doo

10626. Howe 55. (6.8...11.0)

R. A. $20^h 51^m 2^s$ Decl. 0° 0′

A and B

1906.755	71°.6	25″.94
6.813	71.7	25.78
7.463	72.5	26.19
7.465	72.1	25.85
1907.12	72.0	25.94
1912.408	71°.5	26″.35
.411	71.4	26.12
.430	72.0	26.35
1912.42	71.6	26.27

If the principal star has the proper motion given in the *General Catalogue,* the companion is moving with it, as there has been no relative change since 1879. To test this hereafter, I have connected a third small star:

A and C (13.2)

1912.408	118°.6	36″.05
.411	118.8	36.30
1912.41	118.7	36.17

We have from the star catalogues:

Bossert	0″.109	in	204°.2
Paris	0.119	in	180.0
A. G. Nico	0.075	in	180.0
Porter	0.094	in	208.5

10634. β 764. (9.0...9.2)

R. A. $20^h 52^m 22^s$ Decl. — 9° 50′

AB and C (9.0)

1909.515	112°.30	100″.24
.534	112.18	100.04
.570	112.48	100.25
1909.54	112.32	100.18

AB and D (9.0)

1909.515	21°.50	137″.12
.534	21.67	137.08
.570	21.52	137.48
1909.54	21.56	137.23

AB and *a* (11.5)

1909.515	90°.20	58″.16
.534	89.90	58.30
.570	90.52	57.91
1909.54	90.21	58.12

Change in the distant stars doubtful.

10640. Σ 2738. (7.2...8.2)

R. A. $20^h 52^m 57^s$ Decl. + 15° 58′

A and B

1909.438	254°.7	15″.10
.493	254.9	15.26
.496	255.2	15.03
1909.48	254.9	15.13

A and C (8.0)

1909.493	103°.07	210″.37
.496	103.20	210.77
1909.49	103.13	210.57

There may be an error in reducing the distance by Glasenapp.

1875	102°.8	209″.9		A. G. Ber
1889.67	103.1	212.09	1n	Gla

The proper motion of A is small:

A. G. Ber. 0″.019 in 282°.0

h 2097 and star 12.5 m

1909.493	194°.9	96″.66
.496	194.1	96.80
1909.49	194.5	96.73

This is about 50′ *sf* Σ 2738.

1886.67	198°.6	98″.46	1n	Eng

As this is derived from differences in R. A. and Decl., change is not to be inferred.

10642. Ho 598. (8.0...12.0)

R. A. $20^h\ 53^m\ 0^s$ Decl. + 28° 49′

1911.548	111°.3	17″.33
.564	112.2	17.58
.583	112.1	16.98
1911.56	111.9	17.30

The measures are discordant in distance, and change is uncertain.

10643. ε *Equulie.* Σ 2737. (5.7...6.2)

R. A. $20^h\ 53^m\ 5^s$ Decl. + 3° 50′

AB and D (12.8)

1912.465	278°.63	77″.08
.504	278.67	77.03
.507	278.73	77.20
1912.49	278.68	77.10

For the proper motion of AB. This is given:

Auwers	0″.204	in	227°.1
Stumpe	0.202	in	227.7
Boss	0.191	in	221.1

10648. H 928. (9.2...11.6)

R. A. $20^h\ 53^m\ 25^s$ Decl. + 2° 12′

1906.755	81°.5	14″.57
6.813	82.9	14.95
7.578	81.4	15.19
1907.05	81.9	14.90

The change shown by the Cincinnati measure of 1879 is probably explained by a large error in that distance.

10659. Σ 2741. (6.0...7.3)

R. A. $20^h\ 54^m\ 39^s$ Decl. + 50° 0′

A and C (11.0)

1909.493	356°.37	139″.52
.496	356.40	139.40
.512	356.53	139.49
1909.50	356.43	139.47

The first measures are discordant in distance:

1879.98	356°.62	140″.01	in	Bl
1880.34	356.32	138.83	in	Bl

The large star has no certain proper motion from meridian positions:

Groombridge	0″.011	in	242°.7
Boss	0.018	in	25.7

There is a faint star about 10″ from C.

10663. Lalande 40682. (6.0...8.8)

R. A. $20^h\ 54^m\ 58^s$ Decl. + 18° 52′

1912.675	334°.23	46″.18
.678	333.83	46.21
.695	333.53	46.38
1912.68	333.86	46.26

One of these stars, and presumably the larger, has some proper motion. The three sets of measures, on 8 n (1880-1912), give for the movement of Lalande 40682:

0″.057 in 181°.7

The only value found from meridian positions is the following:

Boss 0″.075 in 206°.9

10670. 59 *Cygni.* Σ 2743. (4.7...9.0)

R. A. $20^h\ 55^m\ 44^s$ Decl. + 47° 3′

A and C (11.5)

1912.427	141°.0	26″.42
.430	141.0	26.48
.465	140.8	26.88
1912.44	140.9	26.59

No change in AB. The measures of the small star must be continued for the proper motion of 59 *Cygni.* This is uncertain from the star catalogues:

Auwers	0″.013	in	134°.4
Boss	0.008	in	67.2
Newcomb	0.017	in	108.6

10681. H 1605. (10.7...11.3)

R. A. $20^h\ 56^m\ 37^s$ Decl. + 54° 1′

1909.378	120°.5	20″.90
10.490	119.7	20.60
1909.93	120.1	20.75

H 1606 and H 1605

1909.378	219°.3	208″.76
10.490	219.3	208.82
1909.93	219.3	208.79

No other measures. (See No. 10687 for measures of H 1606.)

10685. Σ 2744. (6.3...7.0)

R. A. $20^h\ 56^m\ 58^s$ Decl. + 1° 4′

AB and C (12.8)

1912.675	101°.35	87″.36
.678	102.52	87.78
.695	102.00	87.64
1912.68	101.96	87.59

For the proper motion of the close pair. The relative motion in the large stars is in the position-angle. For the movement of A we have:

Stumpe	0″.166	in	245°.8
Bossert	0.175	in	250.0
Paris	0.177	in	242.0

10687. H 1606. (9.0...11.0)

R. A. $20^h\ 57^m\ 5^s$ Decl. + 54° 4′

A and B

1909.342	185°.5	18″.61
.378	186.1	18.51
.458	186.2	18.33
1909.39	186.0	18.48

H 1606 and *h* 2099

1909.378	336°.48	54″.15
.458	336.45	54.41
1909.42	336.46	54.28

The last measures connect the principal star of H 1606 with the principal star in *h* 2099. The greatest length of the nebula is about 89″ in the direction of 25°.

10695. H 1607. (8.0...10.5)

R. A. $20^h\ 57^m\ 36^s$ Decl. + 61° 1′

A and B

1909.342	85°.5	10″.36
.493	84.3	10.13
.531	85.2	10.15
1909.46	85.0	10.21

There is a decided motion in angle and distance from the proper motion of A. This from the measures (1873-1909) is:

0″.062 in 233°.9

For verification a third star is connected.

A and C (11.3)

1909.342	333°.65	84″.67
.493	333.17	84.97
.531	333.70	85.05
1909.46	333.51	84.90

10703. Ho 462. (7.8...8.8)

R. A. $20^h\ 58^m\ 27^s$ Decl.— 11° 34′

1909.458	215°.6	2″.59
.493	216.7	2.50
.512	215.2	2.44
1909.49	215.8	2.51

No change.

h 2098 and star 13 m

1909.458	343°.0	96″.80
.493	343.8	95.49
.512	343.2	96.85
1909.49	343.3	96.38

This planetary nebula is about 20′ *sp* Ho 462. The prior measures are:

1890.74	343°.5	96″.38	3n	β.

10719. OΣ (App.) 214. (5.7...8.0)

R. A. $21^h\ 59^m\ 23^s$ Decl. + 41° 9′

A and B

1911.334	185°.39	57″.42
.373	185.12	57.17
.392	185.14	57.37
1911.36	185.22	57.32

B and C (12.2)

1911.373	241°.68	107″.28
.392	241.94	107.31
1911.38	241.81	107.30

As A and B appear to have a common proper motion, I have connected a faint star for an independent value of this movement. From meridian positions this is:

Boss	0″.051	in	177°.5
Kustner	0.056	in	196.3

10725. Σ 2754. (8.0...8.7)

R. A. $21^h\ 0^m\ 29^s$ Decl. + 12° 42′

A and B

1909.589	301°.12	32″.38
.592	301.30	32.20
.630	301.47	32.49
1909.60	301.30	32.36

As the components do not differ greatly in magnitude, the proper motion may be in either. The apparent motion of A is:

0″.031 in 329°.0

To determine this, I have connected a third small star.

A and C (11.8)

1909.589	225°.12	149″.99
.592	225.50	149.51
.630	225.10	150.14
1909.60	225.24	149.88

10727. β 157. (6.7...10.7)

R. A. $21^h\ 0^m\ 31^s$ Decl. — 14° 24′

A and C (12.0)

1908.594	67°.0	10″.05
.636	66.1	9.76
.671	67.3	10.16
.673	67.1	10.03
1908.64	66.9	10.00

From the measures of C to 1904 the proper motion of A is:

0″.364 in 94°.3

From the star catalogues:

Porter	0″.339	in	90°.0
Paris	0.328	in	90.0
Radcliffe	0.308	in	97.5
Hedrick	0.440	in	90.1

10737. Σ 2755. (6.7...10.3)

R. A. 21h 1m 24s Decl. — 0° 39′

1906.755	82°.2	24″.17
7.482	82.2	24.22
7.523	82.6	24.04
1907.25	82.3	24.14

No change since 1827.

10743. β 158. (7.3...11.8)

R. A. 21h 1m 37s Decl. + 47° 19′

1909.534	313°.7	10″.46
.570	313.3	10.78
1909.55	313.5	10.62

In the following measures of the double nebula in the field (Dreyer 7026), the central point was taken for comparison with the stars.

Nebula and star 10.5 m

1909.534	64°.1	26″.85
.570	64.0	26.58
1909.55	64.0	26.71

The earlier measures are:

1879.57	63°.8	25″.25	in	β
1891.69	66.8	26.2	in	Eng

Nebula and star 13.2 m

1909.534	315°.5	48″.91
.570	315.6	48.79
1909.55	315.5	48.85

Nebula and star 13.4 m

1909.534	323°.1	53″.08
.570	322.2	53.13
1909.55	322.6	53.10

From differences in R. A. and Decl.:

1891.69	319°.9	51″.9	in	Eng

This is presumably the brighter of the two stars.

10747. β 680. (8.1...8.6)

R. A. 21h 1m 52s Decl. + 53° 11′

AB and C (10.7)

1908.597	33°.4	22″.75
.636	33.2	22.85
.652	33.1	22.78
1908.63	33.2	22.79

Distance may be decreasing. No material change in the close pair.

10775. Σ 2763. (8.5...9.7)

R. A. 21h 3m 52s Decl. + 16° 52′

1907.559	293°.7	17″.22
.578	293.0	17.06
.581	293.0	17.30
1907.57	293.2	17.19

Measures discordant, and relative motion uncertain.

10782. γ *Equulei.* β 71. (4.7...11.0)

R. A. 21h 4m 30s Decl. + 9° 39′

A and C (10.0)

1912.408	5°.70	46″.21
.411	5.57	46.11
.427	6.23	46.30
1912.41	5.83	46.21

From the four positions of AC by β and Doo (1888-1912), each on 3 n, we have for the proper motion of γ *Equulei:*

0″.154 in 141°.9

Further measures should be made for a final value. From meridian observations:

Auwers	0″.170	in	169°.0
Paris	0.177	in	162.0
Newcomb	0.179	in	162.2
Boss	0.170	in	161.7

10794. Σ 2765. (7.8...8.0)

R. A. 21h 5m 8s Decl. + 9° 4′

A and C (13.5)

1909.589	163°.42	41″.67
.592	163.13	41.41
.630	163.30	41.85
1909.60	163.28	41.64

For the proper motion of AB. No other measures. A and B have a small common proper motion. This is given in A. G. Berlin:

A	0″.022	in	297°.2
B	0.033	in	287.4

10796. Σ 2770. (7.0...10.5)

R. A. 21h 5m 21s Decl. — 3° 37′

1910.678	246°.9	7″.50
.681	246.4	7.66
.684	245.8	7.78
1910.68	246.4	7.65

No motion since 1828.

10803. Σ 2773. (8.2...9.0)

R. A. $21^h 5^m 50^s$ Decl. + 43° 30′

A and C (12.8)

1909.592	63°.9	21″.67
.666	64.2	22.00
.703	63.1	21.67
1909.65	63.7	21.78

The only other measures of C are my own, given in the *General Catalogue.*

A and nebula

1909.592	148°.8	49″.40
.666	151.3	50.26
.703	150.0	49.42
1909.65	150.0	49.69

This small nebula was found by me at the Lick Observatory in June, 1889, and has not been published. There is a faint star near it, 56° : 11″.

10804. H 1621. (8.6...11.3)

R. A. $21^h 6^m 1^s$ Decl. + 54° 33′

1907.559	148°.0	19″.80
.578	148.2	19.58
.675	148.7	19.89
1907.60	148.3	19.76

No other measures.

10808. β 159. (6.1...9.2)

R. A. $21^h 6^m 21^s$ Decl. + 47° 12′

A and C (6.9)

1911.334	189°.97	134″.63
.373	189.26	134.72
.375	189.43	134.29
1911.36	189.55	134.55

A and *a* (13.0)

1911.373	147°.7	14″.52
.392	146.7	14.69
.471	146.9	14.40
1911.41	147.1	14.54

No change in the large stars. No proper motion found in the catalogues.

10811. H 1622.

R. A. $21^h 6^m 39^s$ Decl. + 54° 42′

A and B (13.5)

1907.578	117°.6	8″.42
.675	115.6	8.02
1907.63	116.6	8.22

This is a nearer companion, not previously seen.

A and C (9.5...11.4)

1907.559	294°.9	13″.10
.578	295.7	13.03
.675	295.5	12.80
1907.60	295.4	12.98

No other measures of AC.

10827. Σ 2775.

R. A. $21^h 8^m 30^s$ Decl. — 1° 20′

There is no wide pair here like that measured at Cincinnati and referred to in Part II of the *General Catalogue.* There is a pair of small stars in the field *sp* Σ 2775, but it has a different angle and distance.

a and *b* (9.7...10.0)

1911.509	124°.6	74″.96

a and Σ 2775 (A)

1911.509	200°.2	168″.34

10832. Σ 2780. (6.2...7.2)

R. A. $21^h 8^m 45^s$ Decl. + 59° 30′

A and C (8.5)

1909.342	211°.55	120″.89
.400	211.65	120.77
.458	211.35	121.16
1909.40	211.52	120.94

C is DM (59°) 2333. For comparison we have:

1874	211°.7	119″.9		A. G. Hels.
1878.16	211.54	120.33	2n	Bl.

The large star has no certain proper motion so far as meridian positions are concerned, and this is confirmed by the measures of C.

Auwers	0″.017	in	241°.1
Groombridge	0.013	in	288.0
Boss	0.005	in	231.7

10834. Σ 2776. (7.7...9.0)

R. A. $21^h 8^m 55^s$ Decl. — 10° 51′

A and B

1912.810	51°.77	84″.40
.813	52.18	84.21
.867	51.98	83.78
1912.83	51.98	84.13

No change in BC. The larger star certainly has a small proper motion. The measures by Σ, Δ and β, covering a period of eighty years, give this movement:

0″.019 in 354°.0

10835. Σ 2779. (8.5...8.5)

R. A. $21^h\,9^m\,16^s$ Decl. + 28° 35′

A and B

1908.594	180°.43	17″.11
.597	180.88	17.18
.633	179.97	17.10
1908.61	180.43	17.13

As it is uncertain which of the Struve components is moving, I have connected a third small star.

A and C (12.0)

1908.594	66°.05	58″.30
.597	66.75	58.19
.633	66.37	58.38
1908.61	66.39	58.29

The relative motion in AB is:

0″.047 in 59° (± 180°)

10838. Σ 2778. (8.4...10.6)

R. A. $21^h\,9^m\,28^s$ Decl. — 1° 44′

A and B

1907.463	273°.8	19″.70
.482	274.4	19.72
.523	274.1	19.64
1907.49	274.1	19.69
1909.760	274°.1	19″.59
.780	273.8	19.55
1909.77	273.9	19.57

A and C (11.0)

1909.780	260°.63	71″.74
.782	260.92	72.22
.802	260.87	71.82
1909.79	260.81	71.93

Third star measured for the proper motion of A. From the measures of AB this is:

0″.037 in 211°.5

10846. τ *Cygni.* (4.9...7.4)

R. A. $21^h\,10^m\,0^s$ Decl. + 37° 32′

A and C (13.3)

1911.471	230°.3	28″.01
.487	229.6	28.17
.526	230.9	28.16
1911.49	230.3	28.11

A and D

1908.520	210°.66	162″.60
.556	210.67	162.83
.559	210.57	162.44
1908.54	210.63	162.62

I have previously given in the *General Catalogue* the proper motion of τ *Cygni* from the measures of the distant star, D (1851-1883).

OΣ 0″.474 in 17°.5

From the single measure of C by Hl, and the three β positions, on 10 n (1876-1911), we have the proper motion of τ *Cygni:*

Measures of AC	0″.474	in	22°.2
Measures of AD	0.475	in	17.8

Some of the results from meridian observations are:

Auwers	0″.461	in	19°.1
Newcomb	0.465	in	21.2
Boss	0.455	in	20.3

10847. H 1628. (9.4...9.6)

R. A. $21^h\,10^m\,14^s$ Decl. + 32° 6′

1907.581	252°.0	15″.13
7.636	253.2	15.30
8.520	253.4	15.30
1907.91	252.9	15.24

No change since the measures of Dembowski in 1873.

10862. H 1631. (7.2...11.0)

R. A. $21^h\,11^m\,15^s$ Decl. + 50° 47′

1911.373	16°.85	49″.21
.375	16.43	48.89
.392	17.20	49.02
1911.38	16.83	49.04

No early measures.

10866. H 279. (11.0...11.0)

R. A. $21^h\,11^m\,50^s$ Decl. + 11° 49′

A and B

1910.395	293°.0	5″.34
.397	293.9	5.30
1910.40	293.4	5.32

A and DM (11°) 4531 (8.8)

1910.395	294°.15	124″.59
.397	294.10	124.94
1910.40	294.12	124.76

No other measures.

10880. β 163. (7.1...9.0)

R. A. $21^h\,12^m\,47^s$ Decl. + 11° 4′

AB and C (13.6)

1908.556	242°.07	28″.94
.573	242.00	28.92
1908.56	242.03	28.93

AB and D (13.0)

1908.556	160°.97	50″.08
.573	160.60	50.22
1908.56	160.78	50.15

No other measures of these faint stars.
The proper motion of the close pair is given:

Bossert	0″.196	in	124°.2
Porter	0.075	in	180.0
Paris	0.134	in	144.4
Kustner	0.081	in	180.0

AB and E (10.9)

1908.520	9°.07	82″.76
.556	9.04	83.06
.559	8.87	82.67
.573	9.20	83.15
1908.55	9.04	82.91

The measures of the three small stars should be continued.

10881. β 271. (7.2...9.7)

R. A. $21^h\ 12^m\ 49^s$ Decl. — 26° 51′

A and B

1908.671	243°.8	3″.33
10.742	244.0	3.37
10.760	243.9	3.72
1910.04	243.9	3.47

A system of the 61 *Cygni* type, with large proper motion. This is shown in the measures of the faint star, C:

A and C (12.0)

1908.671	72°.13	80″.94
10.760	72.20	82.40

The prior measures are:

1898.84	74°.2	74″.57	1n	β
1899.75	72.9	75.45	4n	Bar

The measures of C should be continued. The proper motion of AB from meridian positions is:

Porter	0″.693	in	245°.3
Paris	0.676	in	239.1

10885. *υ Cygni.* OΣ 433. (4.6...10.2)

R. A. $21^h\ 12^m\ 59^s$ Decl. + 34° 24′

A and B

1912.675	219°.3	14″.84
.678	219.0	14.76
.698	219.7	14.94
1912.68	219.3	14.85

A and C (10.2)

1912.675	181°.6	21″.16
.678	179.7	21.39
.698	180.0	21.45
1912.68	180.4	21.33

The measures of the two small stars (1849-1912) show clearly that the proper motion of *υ Cygni* is very small and doubtful. A long time-base is required, even in observations with the micrometer. The results given in the star catalogues are uncertain and inconsistent:

Auwers	0″.007	in	237°.1
Boss	0.029	in	136.7

10898. β 1140. (6.7...12.3)

R. A. $21^h\ 14^m\ 1^s$ Decl. + 58° 6′

A and C (12.9)

1912.353	270°.70	69″.79
.408	270.83	69.99
.411	270.34	69.85
1912.39	270.62	69.88

No other measures of C. No proper motion of the large star found in Groombridge, Bradley, Boss, etc. No relative change in AB.

10913. H 934.

R. A. $21^h\ 15^m\ 14^s$ Decl. — 9° 17′

H 934 not identified; faint pairs in the vicinity, but none answering the description fully. About 2^m directly preceding the supposed place of H 934 is *h* 2113. This is a little brighter in the center.

h 2113 and SD (9°) 5711 (9.3)

1909.531	279°.1	137″.26
.534	279.3	137.47
1909.53	279.2	137.36

The comparison star has a small companion 11.8 m, and is the double referred to by Herschel in his note on the nebula.

1909.531	63°.1	25″.58
.534	62.9	25.28
1909.53	63.0	25.43

10917. H 281. (8.7...9.2)

R. A. $21^h\ 15^m\ 32^s$ Decl. + 16° 14′

1908.597	335°.48	14″.11
.633	335.50	14.02
.636	334.70	13.90
1908.62	335.23	14.01
1911.392	335°.4	13″.89
.449	335.1	14.01
.468	334.6	13.94
1911.44	335.0	13.95

The apparent change shown by Herschel's measures of 1829 is due to errors of observation.

10918. Espin 98.

R. A. 21ʰ 15ᵐ 36ˢ Decl. + 51° 49′

A and B (8.0...9.9)

1907.329	310°.3	26″.26
.348	309.8	26.36
.465	310.2	26.45
1907.38	310.1	26.36

A and C

1907.329	87°.3	29″.75
.348	87.5	30.17
.465	87.2	30.10
1907.38	87.3	30.01

C and D (9.9...14.2)

1907.348	261°.0	7″.25
.465	262.0	7.35
1907.41	261.5	7.30

No other complete measures.

10920. Σ 2787. (7.0...8.3)

R. A. 21ʰ 15ᵐ 42ˢ Decl. + 1° 31′

A and B

1908.594	20°.22	22″.72
.597	20.32	22.53
.633	20.17	22.68
1908.61	20.24	22.64

A and C (9.8)

1908.594	94°.83	70″.13
.597	95.22	69.91
.633	95.23	70.41
1908.61	95.09	70.15

Distance of C is larger in the first measure of 1892. No change in AB.

10925. Σ 2790. (5.6...9.9)

R. A. 21ʰ 15ᵐ 55ˢ Decl. + 58° 7′

A and C (10.2)

1909.342	350°.98	74″.18
.400	350.75	73.98
.458	350.78	74.28
1909.40	350.84	74.15

No certain change.

1880.69	350°.70	74″.82	2n	Bl.

For the proper motion of the principal star we have:

A. G. Hels.	0″.027	in	150°.7
Boss	0.013	in	141.7

10932. 1 *Pegasi.* Σ 11, App. II. (4.5...8.6)

R. A. 21ʰ 16ᵐ 32ˢ Decl. + 19° 18′

A and B

1912.810	311°.15	36″.26
.813	311.40	36.42
1912.81	311.27	36.34

A and C (12.4)

1912.810	19°.90	75″.71
.813	20.35	75.70
1912.81	20.12	75.70

No other measures of C. A and B have a common proper motion:

Auwers	0″.112	in	53°.9
Boss	0.117	in	60.3

10936. β *Equulei.* (5.2...13.5)

R. A. 21ʰ 16ᵐ 56ˢ Decl. + 6° 18′

A and B

1912.755	257°.0	34″.35
.791	256.9	34.67
.793	257.7	34.04
1912.78	257.2	34.35

A and C (11.5)

1912.717	306°.56	69″.37
.753	306.75	68.85
.755	306.40	69.40
1912.74	306.57	69.21

A and E (12)

1912.717	273°.28	88″.78
.753	274.75	89.60
.755	275.00	89.25
1912.74	274.34	89.21

From the measures of the small stars (1877-1912) we have the proper motion of the large star with a high degree of accuracy, and this value is not likely to be sensibly changed by future measures. In my measures of AE in 1901 (G. C. Part II) there is an error in reducing the distance; *for* 93″.49 *read* 88″.65.

The measures of the three companions give the annual motion of A:

AB	R. A. + 0″.079	Decl. + 0″.052
AC	.099	.030
AE	.098	.049
	+ 0.092	+ 0.042

Therefore the corrected proper motion of β *Equulei* is:

0″.101 in 65°.5

This motion from the star catalogues is decidedly too small:

Auwers	0″.023	in	66°.7
Boss	0.054	in	83.6

10943. S 788. (7.2...7.3)

R. A. $21^h\ 17^m\ 31^s$ Decl. — 7° 6′

1906.813	88°.7	45″.05
7.465	88.6	45.32
7.482	89.0	44.92
1907.25	88.8	45.10

Proper motion. (See Part II of the *General Catalogue.*) The positions in A. G. Ott. give:

1893.3	88°.7	43″.3

A third star should be connected.

10945. 18 *Aquarii.* H 5517. (5.6...13.1)

R. A. $21^h\ 17^m\ 37^s$ Decl. — 13° 23′

1912.755	321°.13	48″.94
.791	321.35	49.05
.793	321.30	48.77
1912.78	321.26	48.92

From a comparison of this with my single measure in 1877, the proper motion of 18 *Aquarii* is:

0″.112 in 69°.5

The measures should be continued. The star catalogues give this:

Auwers	0″.070	in	88°.4
Boss	0.086	in	88.0

10951. Σ 2796. (7.3...8.8)

R. A. $21^h\ 17^m\ 57^s$ Decl. + 78° 6′

1911.449	42°.85	25″.42
.509	43.00	25.30
.529	42.83	25.34
1911.50	42.89	25.35

From measures on 32 n by Σ, Δ, Hl, Hu and β (1832-1911) the apparent motion of A is:

0″.012 in 198°.3

Although B is not a very small star, it is probable that this is the real proper motion of A.

10959. H 1641. (6.5...11.3)

R. A. $21^h\ 18^m\ 34^s$ Decl. + 23° 46′

1910.397	311°.27	52″.36
.471	312.00	52.20
.473	311.30	53.64
1910.45	311.52	52.73

These measures show that the small star is not moving with the other. A continuation of the measures will give the movement of A. Other values of the proper motion of A are:

Boss	0″.125	in	81°.7
A. G. Ber.	0.111	in	79.7

10966. Σ 25, App. I. (6.0...6.6)

R. A. $21^h\ 18^m\ 57^s$ Decl. + 36° 50′

A and *a* (11.0)

1909.378	155°.20	179″.02
.400	155.13	178.75
.438	155.13	178.73
1909.41	155.15	178.83

The prior measures are uncertain:

1879.91	156°.03	180″.47	in	Bl
1880.36	154.93	178.39	in	Bl.

No change in the bright stars. The distant star has two small companions, the nearest very faint:

a and *b* (14.0)

1909.378	184°.0	10″.60

a and *c* (12.8)

1909.378	326°.7	17″.80
.400	325.8	17.73
.458	325.1	17.77
1909.41	325.9	17.77

11005. H 1647. (6.0...11.0)

R. A. $21^h\ 23^m\ 30^s$ Decl. + 21° 39′

A and B

1912.717	176°.9	40″.80
.753	176.5	40.84
.755	177.4	41.32
1912.74	176.9	40.99

A and C (12.8)

1912.717	127°.4	41″.20
.753	126.0	40.86
.755	125.7	41.26
1912.74	126.4	41.11

The other measures are of late date. No proper motion found for the large star.

11014. 2 *Pegasi.* β 685. (5.5...12.5)

R. A. $21^h\ 24^m\ 31^s$ Decl. + 23° 7′

1907.329	332°.4	29″.69
.348	332.6	29.36
.444	331.1	29.79
1907.37	332.0	29.61

The measures should be continued. For the proper motion of 2 *Pegasi* we have:

Auwers	0″.015	in	82°.5
Boss	0.017	in	103.6

11025. Schj 29. (9.0...9.1)

R. A. 21ʰ 25ᵐ 11ˢ Decl. — 14° 2′

1911.564	293°.28	58″.82
.583	293.55	58.91
.602	293.73	58.72
1911.58	293.52	58.82

The only other measures are my own.

11026. β *Aquarii.*

R. A. 21ʰ 25ᵐ 14ˢ Decl. — 6° 6′

A and B (11.5)

1912.465	318°.8	35″.13
.504	318.8	34.72
.507	318.4	34.95
1912.49	318.7	34.93

A and C (10.9)

1912.465	186°.2	56″.33
.504	184.6	56.44
.507	185.5	56.18
1912.49	185.4	56.32

The early measures of C are discordant in distance. From the measures of AB we have for the proper motion of β *Aquarii:*

0″.020 in 128°.4

Further measures are needed of both companions. The catalogues leave the proper motion very uncertain in amount and direction:

Auwers	0″.008	in	277°.6
Newcomb (Stand.)	0.021	in	142.9
Newcomb (F. C.)	0.020	in	121.5
Boss	0.016	in	115.1

11029. H 3031. (9.5...10.7)

R. A. 21ʰ 25ᵐ 27ˢ Decl. + 1° 9′

1907.578	254°.0	26″.68
.581	253.8	27.05
.772	252.9	26.63
1907.64	253.6	26.79

No other measures.

11032. Σ 2803. (7.4...9.0)

R. A. 21ʰ 25ᵐ 54ˢ Decl. + 52° 24′

1908.594	287°.58	24″.33
.597	288.19	24.55
.633	287.53	24.40
1908.61	287.77	24.43

Change from proper motion of A. From the measures of the small star we have:

Measures	0″.024	in	74°.6
A. G. Harv.	0.014	in	270.0
Groombridge	0.025	in	80.8

11051. Σ 2804. (7.3...8.0)

R. A. 21ʰ 27ᵐ 26ˢ Decl. + 20° 11′

A and C (11.8)

1912.583	105°.53	97″.00
.619	105.50	96.90
.622	105.47	97.50
1912.61	105.50	97.13

It is uncertain whether the change in AB is due to orbital or proper motion. If the latter, the principal star is moving about 0″.014 in 240°. The fact will appear from later measures of the faint star.

11057. H 1657. (8.9...12)

R. A. 21ʰ 28ᵐ 23ˢ Decl. + 47° 57′

1911.449	17°.7	21″.53
.471	17.4	21.61
.487	17.3	21.51
1911.47	17.5	21.55

Never before measured; identified as DM (47°) 3462. The place (1880) as given here.

The cluster referred to by Herschel, of which H 1657 is a part, is *h* 2196.

11077. ε *Capricorni.* H 3040. (4.7...9.5)

R. A. 21ʰ 30ᵐ 22ˢ Decl. — 20° 0′

1911.663	47°.11	68″.24
.698	47.00	67.98
.720	47.35	68.25
1911.69	47.15	68.16

From the three sets of β measures, each on 3 n (1881-1911), the proper motion of ε *Capricorni* is:

0″.022 in 83°.9

The results from the star catalogues are contradictory in all respects:

Auwers	0″.013	in	256°.7
Newcomb	0.016	in	183.9
Boss	0.009	in	103.3

11079. H 938. (8.1...11.8)

R. A. 21ʰ 30ᵐ 30ˢ Decl. + 7° 21′

1907.540	149°.0	17″.51
.578	149.1	17.34
.581	148.9	17.77
1907.57	149.0	17.54

No other measures. Herschel gave the angle 166°.0.

11103. 3 *Pegasi.* Σ 56, App. I. (6.0...7.4)

R. A. $21^h\ 31^m\ 45^s$ Decl. + 6° 5′

A and B

1911.625	348°.62	39″.05
.644	348.71	38.98
.663	349.14	39.07
1911.64	348.82	39.03

As these stars have shown no relative change in three-fourths of a century, I have connected a very faint star for the common proper motion:

A and C (13.2)

1911.625	117°.10	91″.07
.644	117.76	91.05
.663	117.81	90.94
1911.64	117.56	91.01

The proper motion of A from the star catalogues is:

Auwers	0″.039	in	72°.2
Boss	0.052	in	95.5

11107. Σ 57, App. I. (6.5...6.5)

R. A. $21^h\ 31^m\ 58^s$ Decl. + 66° 12′

Whatever proper motion there is, is common to both stars, but it is so small that it is very uncertain in amount and direction. From the Groombridge Catalogue we have:

A	0″.040	in	207°.1
B	0.033	in	107.7

To determine this motion hereafter, I have connected a small star:

A and *a* (10.5)

1909.573	345°.15	123″.68
.589	345.32	123.38
.592	345.22	123.74
1909.58	345.23	123.60

11115. 4 *Pegasi.* H 941. (6.0...12.0)

R. A. $21^h\ 32^m\ 31^s$ Decl. + 5° 14′

1909.589	335°.55	26″.51
.592	335.55	26.24
.630	335.43	26.72
1909.60	335.51	26.49

The measures of this (1878-1909) give for the proper motion of 4 *Pegasi:*

0″.142 in 77°.0

The meridian positions give:

Auwers	0″.089	in	69°.7
Boss	0.103	in	84.5

It would be certain that the motion given by meridian observations is too small, except that the first micrometer measure is on a single night. This will be corrected by later measures.

11125. 24 *Aquarii.* β 1212. (6.5...6.9)

R. A. $21^h\ 33^m\ 20^s$ Decl. — 0° 36′

AB and C (10.9)

1911.602	145°.50	42″.03
.644	145.70	41.77
.663	146.11	42.04
1911.63	145.77	41.95

This will not sensibly change the proper motion of AB previously given from the measures of C to 1904.

Measures	0″.226	in	88°.4
Auwers	0.215	in	82.5
Boss	0.236	in	86.4

11128. Espin 102. (8.1...10.8)

R. A. $21^h\ 33^m\ 36^s$ Decl. + 47° 57′

1908.575	36°.0	11″.47
.597	37.7	11.30
.613	35.3	11.39
1908.59	36.3	11.39

The only other measures are given in the *General Catalogue.*

11129. β 686. (7.7...12.0)

R. A. $21^h\ 33^m\ 43^s$ Decl. + 55° 13′

AB and C (8.3)

1910.473	11°.22	41″.17
.509	10.93	41.23
.529	10.13	41.22
1910.50	10.76	41.21

AB and D (11.1)

1910.473	283°.39	41″.73
.509	282.97	41.51
.529	283.47	41.76
1910.50	283.28	41.67

No change in C since 1875. No other measures of D. The proper motion of the close pair is doubtful:

A. G. Harv. 0″.058 in 270°.0

11147. Espin 140. (8.0...13)

R. A. $21^h\ 34^m\ 42^s$ Decl. + 56° 26′

A and C

1908.575	331°.7	11″.63
.597	332.0	11.66
.613	331.6	11.53
1908.59	331.8	11.61

A and B (14.2)

1908.613	182°.3	6″.57
.636	183.5	6.62
1908.62	182.9	6.60

The very faint companion, B, was detected by Mr. Oliver J. Lee of this observatory. No other measures.

11152. Ho 464. (7.0...11.3)

R. A. 21ʰ 34ᵐ 55ˢ Decl. — 15° 23′

1908.636	104°.4	17″.54
.652	103.6	17.79
.671	104.3	17.85
1908.65	104.1	17.73

The following measure is not given in the *General Catalogue:*

1906.62	103°.9	17″.55	3n	Doo.

11158. 41 *Capricorni.* See 454. (5.4...13.5)

R. A. 21ʰ 35ᵐ 10ˢ Decl. — 23° 48′

1908.671	199°.7	5″.21
10.760	200.4	4.50
1909.71	200.0	4.85

The small star is probably moving with the other. The brilliant compressed cluster, *h* 3128, is closely preceding, same declination.

For the proper motion of 41 *Capricorni* we have:

Auwers	0″.130	in	144°.7
Paris	0.210	in	157.4
Boss	0.131	in	135.4

11172. H 3050. (9.5...10.6)

R. A. 21ʰ 35ᵐ 55ˢ Decl. + 6° 35′

1908.633	46°.1	23″.17
.636	46.7	23.10
.652	46.0	23.38
1908.64	46.3	23.22

The distance in the prior measure of 1895 is much too large.

11184. 76 *Cygni.* S 796. (6.2...9.0)

R. A. 21ʰ 36ᵐ 45ˢ Decl. + 40° 16′

1909.551	231°.50	62″.78
.570	231.38	62.95
.573	231.13	62.83
1906.56	231.34	62.85

Distance probably increasing. The proper motion of 76 *Cygni* is small:

Auwers	0″.048	in	199°.6
Battermann	0.053	in	193.6
Boss	0.052	in	191.4

If the Cincinnati measure of 1879 is substantially correct in the distance of 64″.26, the proper motion of the large star is nearly all in Right Ascension instead of Declination. The measures give:

0″.074 in 276°.3

11205. ε *Pegasi.* S 798. (2.4...11.5)

R. A. 21ʰ 38ᵐ 17ˢ Decl. + 9° 20′

A and B

1910.395	324°.68	82″.11
.397	324.73	81.98
.436	324.90	81.44
1910.41	324.77	81.84

A and C (8.7)

1910.395	320°.58	141″.30
.397	320.50	141.12
.436	320.80	141.40
1910.41	320.63	141.27

If the large star has any proper motion, it is very small and uncertain from meridian positions. The measures of the two small stars show that it is practically zero.

Auwers	0″.009	in	56°.0
Newcomb	0.024	in	260.2
Boss	0.025	in	92.3

11207. Hd 167. (8.0...13.5)

R. A. 21ʰ 38ᵐ 27ˢ Decl. — 6° 44′

A and C (12.0)

1910.455	36°.7	11″.47
.586	35.7	11.56
1910.52	36.2	11.51

The principal star identified as SD (6°) 5814. The only other measures are given in Part I of the *General Catalogue.*

11222. κ *Pegasi.* β 989.

R. A. 21ʰ 39ᵐ 13ˢ Decl. + 25° 6′

AB and C (Σ 2824)

1912.526	295°.9	12″.37
.562	297.4	12.39
.564	297.0	12.51
.581	297.0	12.42
1912.56	296.8	12.42

The proper motion of the binary system from the measures of the 10.8 m Herschel companion (1831-1912) must be practically exact:

0″.034 in 69°.2

From some of the star catalogues we have:

Auwers	0″.020	in	67°.2
Newcomb	0.040	in	71.7
Boss	0.033	in	86.5

11235. OΣ (App.) 224. (7.7...8.5)

R. A. 21ʰ 40ᵐ 3ˢ Decl. + 15° 12′

1908.709	5°.50	58″.53
.711	5.47	58.50
.731	5.51	58.56
1908.72	5.49	58.53

Without material change in distance, but the angle may be diminishing.

11239. δ *Capricorni.* H 3056. (2.8...12.7)

R. A. 21ʰ 40ᵐ 24ˢ Decl. — 16° 40′

1910.589	301°.82	118″.65
.608	302.00	119.81
.627	301.35	118.89
.678	301.93	118.24
1910.63	301.78	118.90

The small star is not moving with the other; and therefore it can be used hereafter for the proper motion of the large star.

Auwers	0″.370	in	141°.6
Bossert	0.387	in	140.8
Boss	0.391	in	138.9

The two measures of the faint star, with an interval of nine years, give:

0″.413 in 134°.3

11241. OΣ 450 *rej.* (7.2...10.0)

R. A. 21ʰ 40ᵐ 32ˢ Decl. + 5° 59′

1910.395	249°.32	42″.31
.397	249.37	42.70
.455	249.55	42.53
1910.42	249.41	42.51

Change in angle?

11270. H 1696. (9.5...12.7)

R. A. 21ʰ 43ᵐ 11ˢ Decl. + 65° 15′

1912.353	138°.6	17″.11
.389	141.9	17.09
.408	138.5	17.07
1912.38	139.7	17.09

As referred to by Herschel, A of H 1696 is one of the chief stars of *h* 2134; coarse and scattered, all small stars.

11296. Σ 2831. (8.1...11.1)

R. A. 21ʰ 45ᵐ 21ˢ Decl. + 7° 47′

1908.845	356°.0	14″.66
9.666	356.8	14.37
9.706	355.4	14.56
1909.41	356.1	14.53

Not fully measured since 1866.

11303. Σ 2834. (7.3...10.6)

R. A. 21ʰ 46ᵐ 2ˢ Decl. + 18° 45′

A and B

1908.575	293°.5	4″.33
.594	293.6	4.40
.613	293.7	4.44
1908.59	293.6	4.39

A and C (13.0)

1908.575	121°.0	26″.14
.594	121.1	25.83
.613	121.1	26.19
1908.59	121.1	26.05

There may be a slight increase in the angle and distance of AB. No other measures of C.

11305. H 5298. (9.5...10.2)

R. A. 21ʰ 46ᵐ 4ˢ Decl. — 16° 22′

1908.636	312°.4	60″.76
.671	312.3	60.17
.673	312.2	60.43
1908.66	312.3	60.45

Probably fixed. There is a 13.5 m star between the two, nearer A.

11315. Ho 172. (7.0...12.0)

R. A. 21ʰ 47ᵐ 5ˢ Decl. + 41° 48′

A and B

1911.392	85°.6	10″.66
.395	85.5	10.44
.430	86.2	10.19
1911.41	85.8	10.43

A and C (12.0)

1911.392	50°.4	54″.92
.395	49.7	55.10
.430	49.4	54.85
1911.41	49.8	54.96

The measures of this star by Doolittle were received too late to be given in the *General Catalogue.* The change shown in the direction and distance of C is confirmed by the present measures.

AB	1906.54	86°.4	10″.60	4n	Doo
AC	1906.67	51.3	53.92	4n	Doo.

There is no substantial change in AB. The measures of C give for the approximate proper motion of A:

0″.262 in 200°.2

A and DM (41°) 4299

1875	Δ R. A. + 35ˢ.93	Δ Decl. + 179″.3	A. G. Bonn
1911.44	+ 36.43	+ 189.7	β

These positions imply a still larger motion in A.

11323. Σ 2840. (6.0...7.0)

R. A. 21ʰ 47ᵐ 57ˢ Decl. + 55° 14′

A and B

1912.542	195°.00	19″.04
.562	195.35	19.02
.564	194.28	18.92
1912.55	194.88	18.99

A and C (13.7)

1912.526	347°.30	55″.18
.562	347.90	55.38
.564	348.17	54.97
1912.55	347.79	55.18

Very little relative change in AB, and the proper motion must be the same.

A	0″.030	in	145°.2	Auwers
	0.015	in	40.9	Groombridge
	0.015	in	93.7	Boss
B	0.044	in	87.4	Groombridge
	0.045	in	67.9	Boss

The faint star is measured for determining the real motion in A, if any. B is Groombridge 3598.

11327. Σ 2838. (6.0...8.8)

R. A. $21^h 48^m 21^s$ Decl. — 3° 52′

1912.810	184°.05	19″.20
.813	184.05	19.19
.829	184.55	19.18
1912.82	184.22	19.19

The measures in point of time are sufficient to give the movement of A with great accuracy. From the four positions on 11 n by Σ, Δ and β (1839-1912) the proper motion of the large star is:

0″.030 in 189°.9

The bright star is not given in Boss' *General Catalogue.*

11334. Σ 2843. (7.0...7.2)

R. A. $21^h 48^m 37^s$ Decl. + 65° 11′

AB and C (10.5)

1912.353	275°.73	56″.25
.389	276.30	56.13
.408	276.73	55.79
1912.38	276.25	56.06

The proper motion of AB is small:

Groombridge 0″.022 in 209°.7

The only other position of C is from the Greenwich *Astrographic Catalogue.* With a scale value of 300″.0, we have from the difference of the coordinates:

1895.7	275°.8	56″.0

11346. β 75. (8.1...8.5)

R. A. $21^h 49^m 40^s$ Decl. + 10° 19′

AB and C (12.5)

1912.408	212°.53	48″.40
.465	212.65	48.40
.504	212.73	48.64
1912.46	212.64	48.48

For the proper motion of AB. This from meridian positions is given:

Porter	0″.164	in	232°.4
Glasgow	0.203	in	209.1

11353. Ho 609. (9.5...9.8)

R. A. $21^h 50^m 4^s$ Decl. + 29° 9′

1909.515	173°.7	3″.03
.725	176.6	3.06
1909.62	175.1	3.04

The early measures are singularly discordant in distance. (See *General Catalogue.*)

11355. Battermann. (9.2...9.3)

R. A. $21^h 50^m 7^s$ Decl. + 15° 2′

A and B

1908.537	162°.5	1″.54
.556	162.8	1.54
.573	162.9	1.56
1908.56	162.7	1.55

A and C (15.0)

1908.556	302°.2	22″.83
.573	300.2	22.87
1908.56	301.2	22.85

A and B have the same proper motion, while C is fixed in space. Later measures of this will give the proper motion of AB.

A. G. Ber. 0″.231 in 141°.2

11359. H 3072. (8.5...10.7)

R. A. $21^h 50^m 25^s$ Decl. + 58° 53′

1910.627	77°.8	13″.20
.660	79.4	12.95
.666	78.2	13.00
1910.65	78.5	13.05

No early measures.

11364. OΣ 454. (7.0...9.0)

R. A. $21^h 50^m 34^s$ Decl. + 23° 46′

A and C (10.8)

1908.594	264°.88	43″.24
.597	265.03	43.20
.633	264.50	43.06
1908.61	264.80	43.17

No change since 1895.

11372. OΣ 455. (7.5...9.0)

R. A. $21^h\ 50^m\ 56^s$ Decl. + 15° 33′

1912.583	270°.4	9″.95
.619	271.2	10.22
.622	270.6	9.91
1912.61	270.7	10.03

The change, if any, since 1847 is confined to a very small increase in the angle. For the proper motion of A we have:

Kustner 0″.039 in 190°.5

11386. Lewis 37. (10.0...11.0)

R. A. $21^h\ 52^m$ ± Decl. + 20° 18′ ±

Not found in sweeping over the rough place given by Lewis.

11393. A. G. 279. (9.6...9.6)

R. A. $21^h\ 53^m\ 29^s$ Decl. + 5° 43′

1909.438	70°.7	9″.73
.496	71.3	9.71
1909.47	71.0	9.72

In the R. A. of this in Part I of the *General Catalogue for* 52^m *read* 53^m.

11396. Sh 336. (7.5...8.1)

R. A. $21^h\ 52^m\ 36^s$ Decl. + 5° 27′

A and B

1908.769	224°.25	99″.88
.788	224.47	99.77
.804	224.97	100.11
1908.79	224.56	99.92

One of these stars has a proper motion in declination of about 0″.10. Both are given in some of the catalogues:

1825	225°.2	103″.7	Weisse
1885	224.6	102.1	A. G. Leip.

To determine which is moving, I have connected a 12 m star:

A and C

1908.785	102°.23	85″.31
.788	101.15	85.24
.824	102.33	85.42
1908.80	101.90	85.32

11401. H 3078. (9.4...9.6)

R. A. $21^h\ 52^m\ 59^s$ Decl. + 0° 42′

1907.444	189°.4	4″.54
.465	191.5	4.13
.559	188.9	4.44
1907.49	189.9	4.37

No other measures.

11422. Howe 59. (7.0...10.5)

R. A. $21^h\ 55^m\ 0^s$ Decl. — 16° 11′

A and C (9.0)

1910.589	291°.95	102″.41
.605	292.06	102.60
.608	291.0	102.78
1910.60	291.7	102.60

The apparent change in distance shown by the measures of Zinner in 1909 of 104″ is not confirmed.

11427. Σ 2851. (8.0...8.3)

R. A. $21^h\ 55^m\ 13^s$ Decl. — 12° 34′

A and B

1912.678	121°.25	18″.92
.695	121.24	18.82
.698	121.50	18.99
1912.69	121.33	18.91

The proper motions of the Struve stars are given by Battermann from transit positions:

A	0″.088	in	90°.0
B	0.071	in	124.3

As there has been no relative motion since 1829, the motions of course are identical. I have therefore connected a third star. No prior measures.

A and C (10.0)

1912.678	133°.65	78″.12
.695	134.00	78.19
.698	134.20	77.90
1912.69	133.95	78.08

11428. 20 *Pegasi.* H 289. (5.8...11.4)

R. A. $21^h\ 55^m\ 14^s$ Decl. + 12° 33′

1908.537	324°.90	52″.93
.556	324.82	53.30
.559	324.74	53.07
1908.55	324.82	53.10

The three positions of the companion (1878-1908) give for the proper motion of A:

0″.080 in 122°.5

From the star catalogues:

Auwers	0″.063	in	142°.7
Greenwich	0.068	in	136.9
Boss	0.077	in	136.7

11433. OΣ (App.) 228. (7.3...9.0)

R. A. $21^h\ 55^m\ 51^s$ Decl. + 4° 12

A and B

1912.526	26°.48	76″.77
.545	26.53	76.75
.562	26.93	76.86
1912.54	26.65	76.79

A and *a* (12.0)

1912.526	159°.0	24″.56
.545	158.8	24.36
.562	159.0	24.66
1912.54	158.9	24.53

The change in AB is probably due to the proper motion of the larger star, though B might have a small movement of its own. The measures (1875-1912) give for the apparent motion of A:

0″.096 in 180°.4

From the star catalogues we have:

Paris	0″.171	in	158°.1
Porter	0.145	in	163.2
Boss	0.160	in	165.1

The continued measures of the faint star near A will give an independent value.

11464. β 696. (8.0...8.0)

R. A. $21^h\,58^m\,43^s$ Decl. + 15° 17′

AB and C (8.3)

1912.638	318°.55	59″.70
.660	318.53	59.89
.675	318.30	59.66
1912.66	318.46	59.75

C and D (9.3)

1912.660	27°.30	85″.18
.675	27.62	85.30
1912.67	27.46	85.24

The proper motion of the close pair is:

A. G. Ber. 0″.092 in 206°.0

C and D are respectively DM (15°) 4556 and 4557. For comparison there is only the following:

AC	1870	316°.6	58″.6		A. G. Ber
	1900.80	317.2	59.48	in	Doo
AD	1870	24.5	84.6		A. G. Ber

From a comparison of the A. G. position of C with the present relation, the proper motion of AB is:

0″.048 in 193°.6

11472. OΣ 460. (7.3...11.7)

R. A. $21^h\,59^m\,32^s$ Decl. + 1° 12′

A and B

1908.537	347°.9	8″.86
.556	347.4	8.92
.573	347.6	8.72
1908.56	347.6	8.83

A and C (11.0)

1908.537	40°.4	16″.75
.556	41.3	16.73
.573	40.3	16.73
1908.56	40.7	16.74

With the measures by OΣ and Hu (1849-1908) we have for the proper motion of the large star:

AB	R. A. + 0″.019	Decl. — 0″.049
AC	0.017	0.038
	+ 0.018	— 0.0435

Therefore the proper motion of A is:

0″.047 in 157°.5

11483. ξ *Cephei*. Σ 2863. (4.7...6.5)

R. A. $22^h\,0^m\,18^s$ Decl. + 64° 2′

A and C (12.7)

1912.353	199°.59	95″.03
.408	198.98	95.60
.411	199.33	95.30
1912.39	199.30	95.31

The large stars form a system of the 61 *Cygni* type. No other measures of the small star. The proper motion of A is given from the star catalogues:

Auwers	0″.195	in	70°.2
Paris	0.254	in	75.1
Porter	0.197	in	70.4
Boss	0.231	in	68.2

11499. 19 *Cephei*. β 697. (6.0...12.0)

R. A. $22^h\,1^m\,27^s$ Decl. + 61° 42′

1912.753	92°.5	19″.87
.755	92.8	19.49
.791	92.7	19.83
1912.77	92.7	19.73

The four β positions of the faint star (1878-1912) show clearly that the proper motion of the bright star is substantially in declination, and not in R. A. as appears from the meridian observations. The several results are:

Measures	0″.032	in	186°.7
Auwers	0.081	in	114.0
Groombridge	0.014	in	37.8
Boss	0.011	in	95.0

11504. Σ 2865. (8.5...9.0)

R. A. $22^h\,1^m\,45^s$ Decl. + 69° 38′

1908.655	188°.1	21″.27
.671	188.9	21.40
.673	189.0	21.49
1908.67	188.7	21.39

No third star near enough to measure. The apparent motion of A from the measures is:

0″.088 in 47°.2

11517. H 3092. (8.9...9.5)

R. A. $22^h\ 2^m\ 53^s$ Decl. — 19° 2′

1909.725	343°.4	28″.45
.802	342.8	28.71
1909.76	343.1	28.58

No change since 1892.

11518.

This is identical with Hu 284 (No. 11515).

11520. Ho 470. (7.0...13.0)

R. A. $22^h\ 3^m\ 24^s$ Decl. + 38° 47′

1908.655	352°.9	12″.68
.671	351.4	12.43
.689	350.6	12.32
1908.67	351.6	12.48

The companion is very faint.

1906.65	353°.1	11″.92	3n	Doo.

11526. π^1 *Pegasi.* (4.3...12.0)

R. A. $22^h\ 3^m\ 54^s$ Decl. + 32° 35′

A and B

1909.496	318°.7	27″.45
.515	317.8	26.95
.534	318.7	27.43
1909.51	318.4	27.28

A and C (11.0)

1909.458	262°.50	71″.17
.473	262.25	70.88
.493	262.40	70.95
1909.47	262.38	71.00

A and D (11.5)

1909.458	89°.08	187″.98
.493	88.97	188.18
.496	88.90	187.96
1909.48	88.98	188.04

The measures of these stars (1879-1909) give for the proper motion of the large star:

AB	R. A. — 0″.045	Decl. — 0″.039
AC	0.051	0.039
AD	0.101	0.112

From this it would appear that there are large errors in the measures of AD, or the small star has a proper motion of its own.

Rejecting that from the above, we have from AB and AC for the proper motion of A:

Measures	0″.062	in	230°.9
Newcomb	0.085	in	211.9
Auwers	0.026	in	235.0
Boss	0.026	in	208.8

To aid in determining whether there is any motion in D, I have connected a small star:

D and *d* (12.6)

1909.589	298°.95	116″.11
.592	298.97	116.63
1909.59	298.96	116.37

11542. Σ 2872. (7.2...8.0)

R. A. $22^h\ 4^m\ 32^s$ Decl. + 58° 42′

A and D (10.7)

1909.531	152°.90	117″.83
.573	152.82	117.53
.589	152.55	117.80
1909.56	152.76	117.72

Without change.

1878.83	152°.82	117″.33	2n	Bl

11559. H 1741. (6.2...9.7)

R. A. $22^h\ 6^m\ 29^s$ Decl. + 50° 14′

1908.597	306°.98	25″.94
.636	306.60	26.06
.652	306.23	26.20
1908.63	306.60	26.07

The large star (Groombridge 3882) has some proper motion:

Measures	0″.160	in	76°.0
Bossert	0.151	in	62.5
A. G. Harv.	0.151	in	62.8
Paris	0.181	in	71.6
Groombridge	0.156	in	79.2

11568. OΣ 465. (7.2...10.7)

R. A. $22^h\ 7^m\ 17^s$ Decl. + 49° 36′

A and B

1908.594	321°.5	14″.36
.597	321.9	14.32
.636	321.1	14.42
1908.61	321.5	14.37

A and C (13.2)

1908.597	235°.1	17″.82
.636	234.8	18.28
1908.62	235.0	18.05

No other observations of C.

11583. O. Stone 57. (9.4...10.7)

R. A. $22^h\ 6^m\ 10^s$ Decl. — 20° 42′

1907.581	97°.6	9″.88
.675	97.0	9.74
.692	96.2	9.88
1907.65	96.9	9.83

Identified as SD (20°) 6379. The corrected place for 1880 is given above.

11588. Ho 291. (7.2...12.7)

R. A. $22^h\ 8^m\ 10^s$ Decl. + 48° 47′

1908.594	198°.0	9″.43
.597	198.7	10.22
.636	199.1	9.41
.652	200.4	9.74
1908.62	199.0	9.70

Change uncertain.

11592. Σ 2877. (6.4...9.6)

R. A. $22^h\ 8^m\ 33^s$ Decl. + 16° 36′

A and B

1910.471	5°.6	12″.59
.473	4.7	12.66
.493	5.2	12.63
1910.48	5.2	12.63

B and C (10.3)

1910.471	300°.43	100″.92
.473	300.62	101.22
.493	300.75	101.02
1910.48	300.60	101.05

It is very improbable that B has any appreciable proper motion. Measures hereafter of the third star will show. The meridian values appear to be too large:

Measures of B	0″.116	in	222°.6
Stumpe	0.166	in	230.9
A. G. Ber.	0.157	in	236.4
Bossert	0.142	in	225.2

11596. Hd 170. (9.7...9.9)

R. A. $22^h\ 8^m\ 51^s$ Decl. + 16° 38′

1908.636	241°.5	7″.39
.652	242.8	7.39
.655	242.0	7.18
1908.65	242.1	7.32

The apparent change from the Harvard measure of 1867 is not confirmed.

11601. A. G. 281. (8.8...10.0)

R. A. $22^h\ 9^m\ 9^s$ Decl. + 21° 21′

1908.711	22°.0	2″.43
.750	20.7	2.44
.766	20.7	2.47
1908.74	21.1	2.45

11602. OΣ 467 *rej.* (6.3...10.3)

R. A. $22^h\ 9^m\ 10^s$ Decl. + 21° 56′

1908.709	274°.1	22″.96
.711	274.0	22.86
.728	273.6	23.06
1908.72	273.9	22.96

No motion.

11613. Σ 2890. (8.5...8.7)

R. A. $22^h\ 10^m\ 26^s$ Decl. + 49° 17′

A and B

1910.490	11°.9	9″.47
.509	10.7	9.20
.512	11.2	9.26
1910.50	11.3	9.31

A and DM (49°) 3788 (9.3)

1910.509	277°.63	72″.91
.512	277.55	73.02
1910.51	277.59	72.96

No change in AB. These stars form a part of *h* 2155.

11625. β 377. (8.0...)

R. A. $22^h\ 11^m\ 23^s$ Decl. + 54° 4′

A and B (10.6)

1911.334	65°.49	59″.23
.375	65.28	58.88
.395	65.30	59.12
1911.37	65.36	59.08

A and *a* (13.0)

1911.395	116°.1	31″.84
.411	116.0	32.07
.468	115.8	31.80
1911.42	116.0	31.90

A and *b* (13.0)

1911.395	262°.5	37″.38
.411	263.2	37.44
.468	262.4	37.36
1911.42	262.7	37.39

A and *d* (12.6)

1911.395	358°.2	57″.85
.411	358.6	57.80
.468	358.1	57.80
1911.42	358.3	57.82

From the four measures by β on 10 n of AB (1891-1911) the proper motion of the principal star is:

0″.258 in 72°.9

Comparing the present measures of the fainter stars with the Greenwich photographic measures in 1899 we have:

A*a*	R. A. + 0″.196	Decl. + 0″.092
A*b*	0.205	0.107
	+ 0.200	+ 0.100

Therefore the approximate proper motion of A is:

0″.223 in 63°.4

From meridian observations:

A. G. Harv.	0″.226	in	81°.4
Porter (Cin ^{13})	0.168	in	56.1
Porter (Cin ^{14})	0.225	in	77.2

11641. Σ 2894. (6.0...8.2)

R. A. 22^h 13^m 40^s Decl. + 37° 10′

A and C (9.6)

1908.537	175°.73	221″.40
.573	174.47	221.55
1908.55	175.10	221.47

B and C

1908.556	174°.37	206″.61
.559	174.24	206.51
.575	174.62	206.73
1908.56	174.41	206.62

For this star we have:

1880.70	174°.00	204″.83	2n	Bl

The measures of the small star should be continued. The proper motion of A is given:

Boss 0″.092 in 48°.6

11657. Σ 2895. (8.5...10.0)

R. A. 22^h 15^m 8^s Decl. + 24° 21′

A and B

1912.619	36°.6	8″.38
.622	36.0	8.37
.638	36.2	8.40
1912.62	36.3	8.38

The proper motion given in Part II of the *General Catalogue* of A will not be sensibly changed by the later measures:

0″.057 in 247°.8

The distant star measured is the principal component of a small pair in the field. The only other position is given in the *General Catalogue.*

A and C (10.0)

1912.619	142°.20	120″.73
.622	142.22	121.18
.638	142.00	120.90
1912.62	142.14	120.94

11659. OΣ 469. (7.2...8.8)

R. A. 22^h 15^m 11^s Decl. + 34° 31′

A and B

1908.750	284°.77	29″.52
.769	284.36	29.96
.788	284.65	29.89
.804	285.30	29.56
1908.78	284.77	29.73

From seven positions, on 22 nights (1846-1908) the apparent motion of A is:

0″.047 in 128°.4

To make certain hereafter that the motion is all in the larger star, I have connected a third 12.2 m star:

A and C

1908.750	51°.43	52″.90
.788	52.37	52.92
.804	52.43	53.61
1908.78	52.08	53.14

11663. γ *Aquarii.* H 3106. (3.9...12.2)

R. A. 22^h 15^m 27^s Decl. — 1° 59′

1909.725	133°.78	41″.09
.744	133.37	41.38
.760	132.68	41.46
.782	133.70	41.66
1909.75	133.38	41.40

From a continuation of these measures, the proper motion of γ *Aquarii* can be found with a high degree of accuracy.

Measures to 1901	0″.142	in	95°.7
Auwers	0.102	in	85.0
A. G. Nico.	0.103	in	80.5
Newcomb	0.123	in	82.9
Boss	0.123	in	85.8

11669. 2 *Lacertae.* H 1755. (4.6...10.8)

R. A. 22^h 16^m 4^s Decl. + 45° 56′

1912.562	9°.23	48″.01
.564	8.98	48.00
.581	8.83	48.12
1912.57	9.01	48.04

No sensible change in the small star since 1879, which would indicate an absence of motion in the bright star. The meridian positions leave the question doubtful:

Auwers	0″.021	in	194°.8
Groombridge	0.025	in	182.4
Boss	0.020	in	90.0

11674. OΣ (App.) 231. (7.2...8.0)

R. A. $22^h 16^m 37^s$ Decl. + 9° 20′

1912.810	110°.10	91″.12
.813	110.70	90.80
.829	110.48	90.86
1912.82	110.43	90.93

No change since 1875.

11677. H 1756. (6.7...10.8)

R. A. $22^h 16^m 42^s$ Decl. + 40° 4′

A and B

1912.562	285°.7	21″.96
.564	286.1	21.89
.581	287.0	22.37
1912.57	286.3	22.07

A and C (13.5)

1912.564	325°.3	22″.39

A and D (11.3)

1912.562	75°.95	57″.86
.564	75.27	58.35
.581	75.35	57.81
1912.57	75.52	58.01

The only other measures are those in the *General Catalogue.*

11686. OΣ (App.) 232. (8.4...8.4)

R. A. $22^h 17^m 34^s$ Decl. + 3° 14′

1906.755	191°.1	67″.64
7.465	191.5	67.76
7.502	191.2	67.82
1907.24	191.3	67.74
1908.709	191°.53	67″.86
.711	191.23	67.97
.728	191.15	68.13
1908.72	191.30	67.99

One of the stars has a small proper motion. For determining hereafter which it is, I have connected a faint star:

A and C (11.4)

1908.728	268°.22	175″.02
.750	268.33	174.57
.788	268.60	174.24
1908.76	268.38	174.61

11691. 51 *Aquarii.* β 172. (6.7...6.7)

R. A. $22^h 17^m 52^s$ Decl. — 5° 27′

AB and C (13.3)

1912.638	341°.40	54″.53
.675	341.83	54.13
.678	341.02	54.42
.695	341.80	54.62
1912.67	341.51	54.43

AB and D (12.0)

1912.638	190°.67	114″.24
.675	190.38	114.65
.678	190.62	114.36
.695	190.48	114.17
1912.67	190.54	114.35

AB and E (10.0)

1912.638	132°.97	131″.46
.675	132.68	132.42
.678	133.02	132.24
.695	133.03	132.47
1912.67	132.93	132.15

The only other measures of the distant Herschel companions depend upon a single night in 1898. It is evident from inspection that the proper motion of 51 *Aquarii* is very small, if there is any motion at all. The time interval is too short, and the errors in a single measure possibly too large to give an accurate value for a proper motion as small as this seems to be, but in any event it should be as reliable as that found in any other way, and a continuation of the measures after the proper interval will cure these defects. Comparing the present positions with the single observations referred to, we have for the approximate motion of the large star:

AC	R. A. + 0″.002	Decl. + 0″.001
AD	+ 0.001	+ 0.005
AE	+ 0.003	— 0.005

From which we have for the proper motion of 51 *Aquarii:*

0″.002 in 80°.6

From the star catalogues the results are contradictory:

Auwers	0″.015	in	277°.6
Hedrick	0.019	in	124.8
Boss	0.024	in	90.0

11712. Ho 616. (7.2...12.5)

R. A. $22^h 19^m 43^s$ Decl. + 21° 58′

1909.706	356°.7	19″.56
.725	356.3	19.69
.742	358.6	19.21
1909.72	357.2	19.49

The companion is very faint; probably no change.

11716. 34 *Pegasi.* β 290. (6.1...12.5)

R. A. $22^h 20^m 31^s$ Decl. + 3° 47′

A and C (13.0)

1911.564	271°.60	101″.34
.583	271.60	101.13
.644	272.23	101.13
1911.60	271.81	101.20

For the proper motion of the close pair.

Auwers	0″.259	in	80°.7
Porter	0.259	in	81.1
Boss	0.295	in	81.6

11732. β 291. (8.4...8.4)

R. A. 22ʰ 21ᵐ 39ˢ Decl. + 3° 55′

AB and C (13.5)

1911.564	123°.8	30″.49
.583	123.9	30.79
.644	123.1	30.59
1911.60	123.6	30.62

The binary system has little or no proper motion.

11736. β 701. (7.0...10.0)

R. A. 22ʰ 22ᵐ 10ˢ Decl. + 11° 38′

A and C (11.0)

1910.703	128°.45	118″.92
.720	128.98	119.24
.739	128.80	119.17
1910.72	128.74	119.11

For the proper motion of AB. No other measures.

Porter	0″.166	in	79°.6
Glasgow	0.227	in	71.8
Paris	0.201	in	83.4

11745. Σ 2907 *rej.* (9...10)

R. A. 22ʰ 22ᵐ 42ˢ Decl. — 10° 33′

A and B

1910.742	158°.3	36″.43
.760	158.0	36.31
.777	157.9	36.17
1910.76	158.1	36.30

A and C

1910.742	229°.8	47″.70
.760	230.1	47.73
.777	229.8	47.78
1910.76	229.9	47.74

No early measures. The magnitudes are from Herschel.

11752. β 478. (9.0...11.0)

R. A. 22ʰ 23ᵐ 8ˢ Decl. — 7° 56′

A and B

1907.523	37°.2	1″.45
.657	32.5	1.43
.675	31.5	1.21
1907.62	33.7	1.36

A and C (9.0)

1907.523	239°.5	28″.92
.657	238.9	28.84
1907.59	239.2	28.88

A and *a* (13.5)

1907.675	52°.7	18″.34

The prior measures are given in the *General Catalogue.*

11761. Kr 60. (9.0...12.0)

R. A. 22ʰ 23ᵐ 43ˢ Decl. + 57° 6′

A and B

1907.444	107°.5	3″.29
.463	108.2	3.38
.465	109.0	3.04
.482	109.6	3.32
1907.46	108.6	3.26
1908.482	104°.3	3″.25
.520	105.0	3.33
.537	104.4	3.11
.556	104.0	3.20
.573	104.6	3.12
1908.53	104.5	3.20
1909.534	99°.1	3″.20
.570	100.1	3.06
.592	99.1	3.00
.703	99.4	3.00
1909.60	99.4	3.06
1910.471	97°.9	3″.35
.473	95.7	3.19
.490	96.6	3.09
.509	94.7	3.09
1910.49	96.2	3.18
1911.411	88°.8	3″.00
.468	90.5	3.04
.471	91.3	3.00
.487	89.3	3.22
1911.46	90.0	3.06

The only sensible change in AB is in the position-angle. The period will be uncertain for at least another half-century, and perhaps much longer.

A and C (9.2)

1907.444	59°.25	42″.52
.463	59.18	42.57
.465	59.33	42.40
.482	59.20	42.44
1907.46	59.24	42.48
1908.482	59°.50	43″.46
.520	59.53	43.55
.537	59.33	43.48
.556	59.30	43.54
.559	59.57	43.39
1908.53	59.45	43.48
1909.534	59°.41	44″.56
.570	59.52	44.34
.592	59.01	44.94
.630	59.51	44.58
1909.58	59.36	44.60
1910.471	59°.50	45″.28
.473	59.40	45.28
.490	59.25	45.38
.509	59.10	45.41
1910.49	59.31	45.34

1911.411	59°.30	46″.27
.468	59.40	46.06
.471	59.43	46.06
.487	59.08	46.17
1911.46	59.30	46.14

From 20 positions of AC (1890-1911) the proper motion of A is:

0″.934 in 242°.5

This will not be materially changed by later measures.

A and DM (56°) 2784

1910.509	141°.90	200″.93
.529	142.15	200.68
.531	142.02	200.93
1910.52	142.02	200.85
1911.411	141°.93	200″.59
.471	142.00	200.81
.487	142.05	200.64
1911.46	141.99	200.68

The motion deduced from the measures of the distant star of course should be exactly the same, but the agreement is all that could be expected, considering the fact that the interval covered by the micrometer positions is only ten years.

0″.920 in 246°.2

11772. δ *Cephei.* β 702. (3.0...13.0)

R. A. $22^h 24^m 43^s$ Decl. + 57° 48′

A and B

1911.411	284°.6	19″.67
.468	284.7	19.62
.471	285.3	20.30
.487	286.0	19.74
1911.46	285.1	19.83

The proper motion of δ *Cephei* is small; and, therefore, from meridian observations uncertain in direction and amount. Some of these values are:

Auwers	0″.010	in	151°.9
Groombridge	0.018	in	112.4
Newcomb	0.013	in	83.6
Boss	0.012	in	75.9

From the three sets of measures of AB on 9 n (1878-1911) we have for a corrected and independent value:

0″.017 in 77°.2

The measures should be continued after the proper interval for a final correction.

The proper motion of the Struve companion C (Bradley 2972) is given:

Auwers	0″.027	in	111°.7
Boss	0.028	in	69.2

As there has been no sensible change in AC in 75 years, the proper motion is evidently the same for each star.

11773. OΣ 472 *rej.* (6.8...11.7)

R. A. $22^h 25^m 6^s$ Decl. + 51° 48′

1910.698	1°.6	14″.49
.701	1.0	14.55
.703	0.7	14.34
1910.70	1.1	14.46

The distance may be decreasing. The proper motion of A is:

A. G. Harv. 0″.043 in 330°.7

11778. OΣ 473. (6.7...10.0)

R. A. $22^h 25^m 46^s$ Decl. + 56° 37′

1912.717	357°.2	14″.69
.753	357.2	14.77
1912.73	357.2	14.73

No change since 1848. No proper motion found in the leading star catalogues.

11779. Σ 2917. (8.0...8.0)

R. A. $22^h 25^m 50^s$ Decl. + 52° 55′

A and C (11.5)

1911.334	186°.60	89″.47
.373	186.45	89.54
.375	185.60	89.51
1911.36	186.22	89.51

For the proper motion of AB. No change in the Struve companion.

A. G. Harv. 0″.097 in 90°.0

11781. H 1777. (9.0...12.0)

R. A. $22^h 25^m 54^s$ Decl. + 47° 49′

1911.334	320°.5	11″.09
.373	319.8	11.32
.392	318.9	11.32
1911.36	319.7	11.24

Evidently an error in the Cincinnati distance of 1879.

11786. α *Lacertae.* β 703. (3.8...12.0)

R. A. $22^h 26^m 21^s$ Decl. + 49° 40′

1912.408	294°.53	34″.26
.427	296.18	34.24
.430	295.68	34.60
1912.42	295.46	34.37

From the measures of the faint star (1878-1912) the corrected proper motion of α *Lacertae* is:

0″.135 in 88°.3

From some of the star catalogues this is:

Auwers	0″.133	in	85°.7
Paris	0.149	in	87.3
Boss	0.141	in	84.7

11789. Σ 2915. (8.5...8.7)

R. A. $22^h\,26^m\,33^s$ Decl. + 6° 48′

A and B

1910.493	147°.6	12″.73
.529	147.2	12.39
.570	147.5	12.83
1910.53	147.4	12.65

From the measures of Σ, Δ and β (1827-1910) the apparent proper motion of A is:

0″.056 in 252°.8

No suitable third star for the micrometer.

A and DM (6°) 5033 (8.8)

1875	Δ R. A. 30ˢ.18	Δ Decl. 49″.4	A. G.
1910.5	30.08	49.7	β

These observations indicate that the proper motion is in B.

11794. H 1779. (8.3...9.5)

R. A. $22^h\,27^m\,8^s$ Decl. + 33° 37′

1910.698	216°.9	22″.28
.701	217.0	22.12
.703	217.0	22.18
1910.70	217.0	22.19

Herschel's angle in 1828 was 244°.9. *h* 2172 is 4½ᵐ *f* and 10′ *n* of H 1779; small and elongated in 347°.

h 2172 and star 12.7 m

1910.739	35°.5	93″.2

11798. A. G. 283. (8.7...9.1)

R. A. $22^h\,27^m\,36^s$ Decl. + 54° 35′

1910.698	336°.4	2″.73
.701	335.9	2.90
.703	335.3	2.63
1910.70	335.9	2.75

11803. β 77. (9.5...10.3)

R. A. $22^h\,27^m\,50^s$ Decl. — 2° 24′

A and C (12.5)

1912.810	227°.7	27″.45
.813	226.1	27.91
.867	225.8	28.16
1912.83	226.5	27.84

There may be a small decrease in distance.

11814. Σ 2920. (7.1...8.2)

R. A. $22^h\,28^m\,27^s$ Decl. + 3° 36′

A and B

1907.523	143°.6	13″.65
.540	144.1	13.57
.559	142.9	13.70
1907.54	143.5	13.64

A and C (13.1)

1907.523	64°.1	20″.59
.540	64.5	20.30
.675	64.7	20.30
1907.58	64.4	20.40

The distance of AC is 1″.8 less than Hall's in 1878. No change in AB.

11821. Ho 617. (8.0...13.5)

R. A. $22^h\,29^m\,13^s$ Decl. + 21° 41′

1907.772	53°.3	17″.49
7.807	51.1	17.91
8.518	53.9	17.62
1908.03	52.8	17.67

Probably without change.

11822. H 3122. (7...10)

R. A. $22^h\,29^m\,22^s$ Decl. — 21° 33′

1909.802	247°.44	50″.51
10.627	247.38	51.02
10.666	247.58	51.08
1910.36	247.47	50.87

No other measures.

11823. Hn 51. (8.5...8.9)

R. A. $22^h\,29^m\,23^s$ Decl. + 1° 57′

A and B

1910.703	182°.8	0″.97
.739	181.7	0.92
1910.72	182.2	0.94

AB and DM (1°) 4632 (9.5)

1910.701	29°.25	131″.56
.703	29.38	131.61
.710	29.27	131.78
1910.70	29.30	131.65

The distant star for the proper motion of AB.

Boss	0″.161	in	60°.3

11824. Arg 44. (8.9...8.9)

R. A. 22ʰ 29ᵐ 23ˢ Decl. + 49° 46′

1907.463	168°.0	7″.42
.482	169.4	7.39
.485	168.9	7.34
1907.48	168.8	7.38

Without change since 1877.

11828. Σ 2924. (6.8...7.3)

R. A. 22ʰ 29ᵐ 33ˢ Decl. + 69° 17′

A and B

1910.678	92°.3	0″.60
.684	96.5	0.85
1910.68	94.4	0.72

AB and C (11.3)

1910.666	192°.77	114″.79
.681	192.80	114.26
.684	192.80	114.01
1910.68	192.79	114.35

AB and D (11.0)

1910.678	194°.67	178″.20
.681	194.60	178.78
.684	194.27	177.85
1910.68	194.51	178.28

Distant stars for the proper motion of AB.

A. G. Chris.	0″.122	in	58°.0
Porter	0.118	in	58.2
Schroeter	0.114	in	63.3

11833. Σ 2921 *rej.* (9.0...9.7)

R. A. 22ʰ 29ᵐ 51ˢ Decl. — 0° 27′

A and B

1910.701	215°.7	20″.57
.703	214.8	20.56
.720	215.5	20.61
1910.71	215.3	20.58

A and C

1910.701	175°.6	84″.99
.703	175.3	84.94
.720	176.3	84.48
1910.71	175.7	84.80

All the measures are of recent date.

11834. Σ 2923. (6.9...9.2)

R. A. 22ʰ 29ᵐ 53ˢ Decl. + 69° 45′

A and C (11.9)

1911.509	146°.35	97″.38
.526	146.13	97.05
.529	145.95	96.51
1911.52	146.14	96.98

No other measures of C. The proper motion of A is given:

Groombridge	0″.074	in	70°.3
Boss	0.063	in	68.5
Schroeter	0.040	in	81.5

11845. H 1791. (7.4...9.0)

R. A. 22ʰ 31ᵐ 2ˢ Decl. + 56° 14′

A and C (11.0)

1910.666	150°.40	84″.82
.678	150.37	84.34
.681	150.30	84.08
1910.67	150.36	84.41

To verify the supposed proper motion of A.

Greenwich	0″.152	in	251°.6

11847. Ho 618. (7.7...12.7)

R. A. 22ʰ 31ᵐ 32ˢ Decl. + 26° 6′

1909.760	240°.6	6″.61
10.605	241.7	6.67
10.627	240.6	6.53
1910.33	241.0	6.60

Change in angle. The principal star evidently has some proper motion. From the three positions by Ho, Doo and β on 9 n (1894-1910) the motion of A is:

0″.115 in 137°.8

11848. ϰ *Aquarii.* (5.4...11.0)

R. A. 22ʰ 31ᵐ 32ˢ Decl. — 4° 51′

1909.744	247°.00	100″.61
.760	247.35	100.30
.763	246.68	100.52
1909.75	247.01	100.48

No other measures. At one time Herschel suspected a very small companion (= H 5529) but this has never been seen since, and certainly does not exist.

The proper motion of ϰ *Aquarii* is given:

Auwers	0″.140	in	219°.7
Porter	0.143	in	219.7
Paris	0.126	in	214.0
Boss	0.139	in	214.0

11862. β 1092. (7.5...7.5)

R. A. 22ʰ 33ᵐ 3ˢ Decl. + 72° 15′

AB and C (12.2)

1911.526	262°.08	31″.34
.529	261.83	31.51
.545	262.40	31.43
1911.53	262.10	31.43

Rejecting the measure of 1898 because it is on a single night, from the three sets of measures by A and β, each on 3 n, we have for the proper motion of the binary system

0″110 in 58°2

From meridian positions:

Greenwich	0″122	in	75°7

11866. Σ 2928. (8.0...8.0)

R. A. $22^h\,33^m\,10^s$ Decl. — 13° 14′

A and B

1908.671	311°1	3″87
.673	311.1	3.98
.692	312.2	3.79
1908.68	311.5	3.88

This is a system of the 61 *Cygni* type. In the *General Catalogue* I have shown from the measures of AB (1830-1902) that the apparent movement of A is:

0″018 in 24°1

From the star catalogues we have for the proper motion of A:

Stumpe	0″291	in	118°7
Porter	0.268	in	122.8
Paris	0.275	in	125.0

Taking a mean of the last two for the movement of A, the proper motions of the components are

A	0″272	in	123°9
B	0.275	in	127.5

For an independent value of this, I have measured a faint star.

A and C (13.0)

1908.671	245°10	97″48
.673	245.42	98.06
.750	245.07	98.15
1908.70	245.20	97.90
1912.678	244°93	98″54
.695	244.30	98.94
.717	245.66	97.88
1912.69	244.96	98.45

11869. H 1795. (10.8...10.9)

R. A. $22^h\,33^m\,18^s$ Decl. + 46° 43′

A and B

1910.666	212°8	11″85
.678	213.9	11.75
.681	216.6	11.77
1910.67	214.4	11.79

A and C (10.9)

1910.666	31°6	16″82
.678	30.6	17.01
.681	30.8	16.69
1910.67	31.0	16.84

No other measures; no fourth star as suspected by Herschel.

A and DM (46°) 3768 (8.5)

1910.666	187°87	102″68
.678	187.77	102.72
.681	187.83	102.89
1910.67	187.82	102.76

11877. 10 *Lacertae.* S 813. (5.0...10.0)

R. A. $22^h\,33^m\,52^s$ Decl. + 38° 26′

1910.720	48°90	61″35
.739	48.95	61.62
.742	49.25	61.44
1910.73	49.03	61.47

The meridian positions are uncertain as to the proper motion of 10 *Lacertae:*

Auwers	0″013	in	90°0
Boss	0.009	in	180.0

The measures make the motion substantially all in R. A. but in the opposite direction. The measures of OΣ and β, 1854 to 1910, give:

0″014 in 265°5

11882. Espin 106. (9.2...9.7)

R. A. $22^h\,34^m\,5^s$ Decl. + 48° 48′

1908.518	266°7	8″02
.520	267.9	7.98
.537	267.3	8.06
1908.52	267.3	8.02

No other complete measures.

11884. Ho 187. (6.1...10.2)

R. A. $22^h\,34^m\,6^s$ Decl. + 37° 7′

1908.750	286°5	18″91
.769	285.7	18.77
.788	286.2	18.65
1908.77	286.1	18.78

Probably no change.

11895. Ho 296. (5.5...5.5)

R. A. $22^h\,34^m\,56^s$ Decl. + 13° 55′

AB and C (11.3)

1910.666	234°20	68″06
.678	234.38	68.22
.681	234.77	68.26
1910.67	234.45	68.18

For proper motion of AB. This from the catalogues is:

Porter	0″290	in	65°3
Glasgow	0.304	in	60.5
Paris	0.288	in	64.5

11905. ζ *Pegasi.* (3.5...11.0)

R. A. 22h 35m 38s Decl. + 10° 12′

1907.657	138°.93	62″.92
.675	139.18	63.70
.692	139.05	63.42
.695	139.98	63.16
1907.68	139.28	63.30

The proper motion of the large star from the three β positions (1879-1907) is:

0″.070 in 79°.8

From meridian observations:

Newcomb	0″.080	in	100°.0
Boss	0.078	in	98.9
Auwers	0.067	in	105.5

11906. Σ 2932. (8.7...9.2)

R. A. 22h 35m 50s Decl. + 29° 25′

A and B

1908.750	280°.7	20″.12
.766	281.2	20.01
.769	281.4	20.16
1908.76	281.1	20.10
1909.742	281°.1	20″.32
.744	280.9	20.26
.760	281.2	20.24
1909.75	281.1	20.27

A and C (11.0)

1908.750	12°.8	30″.02
.766	13.1	30.06
.769	12.2	29.92
1908.76	12.7	30.00
1909.742	12°.8	30″.14
.744	12.2	30.00
.760	12.7	29.70
1909.75	12.6	29.95

No evidence of material change in AB. The other measures of C are of late date.

11907. H N. 140. (6.5...9.1)

R. A. 22h 35m 51s Decl. — 5° 44′

A and B

1911.529	262°.97	73″.81
.545	262.93	74.05
.564	262.80	74.28
1911.55	262.90	74.05

The only other measures are my own in 1901.

A and C

1911.526	182°.02	161″.88
.529	182.00	162.06
.545	182.45	162.68
1911.53	182.16	162.21

C is SD (5°) 5842. The meridian positions give:

1890.7	181°.6	162″.6	A. G. Stras.

11910. 12 *Lacertae.* S 815. (5.4...10.0)

R. A. 22h 36m 6s Decl. + 39° 36′

1910.509	15°.43	69″.95
.529	15.65	69.66
.548	15.90	69.45
1910.53	15.66	69.69

The proper motion of 12 *Lacertae* from the measures (1881-1910) is:

Measures	0″.037	in	52°.8
Auwers	0.023	in	82.6
Boss	0.021	in	250.4

11924. η *Pegasi.* β 1144. (3.0...10.3)

R. A. 22h 37m 23s Decl. + 29° 36′

A and BC

1909.742	338°.83	90″.91
.744	338.59	91.12
.760	338.85	90.75
1909.75	338.76	90.93

The proper motion of the large star is:

Auwers	0″.038	in	183°.9
Boss	0.036	in	163.4
Newcomb	0.040	in	158.5

The change in the small star indicates a very small motion. The measures should be continued.

11930. OΣ 477. (7.2...11.1)

R. A. 22h 38m 16s Decl. + 45° 24′

A and C (11.0)

1909.400	348°.78	177″.55
.438	348.50	177.38
.458	348.55	177.63
1909.43	348.61	177.52

C and *c* (12.5)

1908.400	126°.3	10″.49
.438	125.5	10.29
.458	125.5	10.20
1908.43	125.8	10.33

The only other measure of C is:

1880.28	350°.14	176″.21	2n	Bl

These positions give substantially the same proper motion of A as that derived from the measures of AB, but in view of the number of measures, and especially the shorter time interval, this value at this time is entitled to much less weight.

Measures of AB	0″.180	in	94°.8
Greenwich	0.181	in	94.1

11931. H 5359. (9...9+)

R. A. $22^h\ 38^m\ 34^s$ Decl. —4° 37′

A and C (12)

1910.684	347°.0	16″.60
.701	347.2	16.86
.739	345.6	16.55
1910.71	346.6	16.67

A and B

1910.684	64°.9	20″.27
.701	65.6	20.56
.739	65.4	20.59
1910.71	65.3	20.47

Only very recent measures. The magnitudes given here are by Herschel.

11936. β 450. (7.0...9.2)

R. A. $22^h\ 38^m\ 40^s$ Decl. + 38° 50′

A and C (12.5)

1910.742	235°.7	10″.37
.760	237.9	10.30
.777	235.8	10.56
1910.76	236.5	10.41

The change in C is explained by the proper motion of AB (Σ 2942). This is given from meridian positions:

Battermann	0″.027	in	235°.9

The measures of AC (1878-1910) give:

0″.024 in 169°.8

11938. 13 *Lacertae.* OΣ 479. (5.4...10.8)

R. A. $22^h\ 38^m\ 44^s$ Decl. + 41° 11′

1910.684	128°.5	14″.77
.698	129.8	14.83
.701	129.2	14.79
1910.69	129.2	14.80

No relative change. The proper motion of 13 *Lacertae* is small:

Auwers	0″.035	in	290°.1
Newcomb	0.016	in	306.9
Boss	0.011	in	303.6

11942. H 1807. (8.5...8.5)

R. A. $22^h\ 39^m\ 29^s$ Decl. + 67° 6′

A and BC

1910.760	188°.4	23″.37
.777	189.0	23.07
.780	187.8	23.68
1910.77	188.4	23.37

The only other measure is that of 1899.

B and C (= Hu 92)

1910.780	350°.7	0″.88

The proper motion of the principal star is:

Schroeter	0″.089	in	252°.3

11952. Σ 2941. (7.5...10.2)

R. A. $22^h\ 40^m\ 7^s$ Decl. + 18° 37′

1910.681	264°.3	11″.41
.698	265.0	11.22
.701	264.2	11.31
1910.69	264.5	11.31

The measures by Σ, Δ and β (1830-1910) give for the proper motion of A:

0″.034 in 62°.8

11957. ξ *Pegasi.* H 301. (4.3...12.3)

R. A. $22^h\ 40^m\ 42^s$ Decl. + 11° 33′

A and C (12.6)

1907.711	17°.60	138″.32
.731	17.65	138.06
.750	17.00	138.65
1907.73	17.42	138.34
1912.810	15°.93	140″.45
.813	16.42	140.56
.867	16.43	140.22
1912.83	16.26	140.41

The only other measure of this star is:

1879.52	21°.75	127″.33	2n	β^3

These positions give for the corrected proper motion of the large star:

0″.541 in 155°.1

From the catalogues we have:

Auwers	0″.514	in	158°.9
Porter	0.541	in	158.9
Paris	0.528	in	157.2
Boss	0.545	in	155.2

11966. OΣ 480. (7.5...8.2)

R. A. 22^h 41^m 19^s Decl. + 57° 27′

1910.531	116°.85	30″.75
.548	116.70	30.46
.570	117.09	30.75
1910.55	116.88	30.65

No change. The proper motion of A is:

Greenwich	0″.063	in	180°.7

11967. τ^1 *Aquarii.* Σ 2943. (6.0...9.2)

R. A. 22^h 41^m 20^s Decl. — 14° 41′

1910.742	116°.26	26″.36
.760	117.61	25.97
.777	117.08	26.19
1910.76	116.98	26.17

No third star available. The measures of the small star (1831-1905) give for the proper motion of τ^1 *Aquarii:*

0″.065 in 87°.7

From the star catalogues we have:

Auwers	0″.019	in	180°.0
Hedrick	0.037	in	111.8
Boss	0.037	in	110.5

11975. H 1810. (8.5...10.4)

R. A. 22^h 42^m 22^s Decl. + 57° 30′

1910.531	355°.4	21″.09
.548	355.5	20.69
1910.54	355.4	20.89

The components of H 1810 are among the principal stars of *h* 2182. The DM number in Part I of the *General Catalogue* should be 2607 instead of 2617.

11985. τ^2 *Aquarii.* H VI. 97. (4.2...9.5)

R. A. 22^h 43^m 14^s Decl.— 14° 13′

1910.742	294°.53	132″.66
.760	294.70	132.71
.777	294.28	132.71
.780	294.53	132.33
1910.77	294.51	132.60

The measures should be continued. The only reliable early measure is by Dawes, but on only a single night. Comparing that with the present position, gives for the proper motion of A:

Measures	0″.060	in	196°.2
Boss	0.039	in	204.0
Auwers	0.047	in	233.5

11986. β 1219.

R. A. 22^h 43^m 27^s Decl. — 11° 42′

The Herschel nebula 3^m 50^s *p* β 1219 is somewhat diffused, but brighter in the center.

h 2180 and star 11.9 m

1909.534	147°.6	117″.22
.630	147.7	116.67
.703	147.0	115.89
1909.62	147.4	116.59

11997. Σ 2947. (7.2...7.2)

R. A. 22^h 44^m 54^s Decl. + 67° 56′

This may be a pair of the 61 *Cygni* type, the components having slightly different proper motions. To verify the motion of A as given from meridian positions, I have connected a faint star.

A and C (11.0)

1910.720	206°.57	109″.28
.739	206.04	109.44
.742	206.10	109.16
1910.73	206.24	109.29

The proper motion is given:

Schroeter	0″.146	in	66°.6
Groombridge	0.155	in	54.1

11998. H 3147. (9.0...12.0)

R. A. 22^h 45^m 5^s Decl. + 72° 18′

1912.411	239°.7	29″.87
.427	239.6	29.36
.430	239.7	29.67
1912.42	239.7	29.63

The only other complete measures are of late date. Taken in connection with Herschel's angle of 252°.0 in 1830, the larger component has some proper motion.

12008. Ho 482. (6.8...6.8)

R. A. 22^h 45^m 41^s Decl. + 25° 45′

AB and C (9.0)

1909.742	198°.50	50″.53
.744	198.50	50.72
.763	198.53	50.41
1909.75	198.51	50.55

The only other measure is that in Part II of the *General Catalogue.*

12019. 15 *Lacertae.* β 451. (5.1...12.0)

R. A. $22^h 46^m 37^s$ Decl. + 42° 40′

A and B

1908.518	132°.23	28″.34
.520	132.78	28.08
.537	132.28	27.93
1908.52	132.43	28.12

The five measures of B (1888-1908) give for the proper motion of 15 *Lacertae:*

0″.126 in 76°.2

From the star catalogues:

Auwers	0″.097	in	85°.9
Boss	0.106	in	81.3

A and C (11.9)

1908.518	309°.89	102″.86
.520	310.00	102.91
.537	309.67	102.89
1908.52	309.85	102.89

A and D (12.3)

1908.518	227°.75	127″.40
.520	227.85	127.92
.537	227.70	127.78
1908.52	227.73	127.70

No other measures of C and D.

12021. Σ 2950. (5.7...7.0)

R. A. $22^h 46^m 40^s$ Decl. + 61° 3′

A and C (10.6)

1910.720	354°.23	39″.03
.739	353.83	39.17
.742	354.58	39.12
1910.73	354.21	39.11

For the proper motion of AB.

Bossert	0″.116	in	69°.8
A. G. Hels.	0.115	in	71.2
Boss	0.119	in	69.3
Auwers	0.117	in	71.6

12031. Ho 191. (8...11.7)

R. A. $22^h 47^m 53^s$ Decl. + 30° 7′

A and B

1907.731	91°.7	3″.14
.750	87.9	3.17
1907.74	89.8	3.15

A and C (10.5)

1907.638	279°.9	24″.33
.695	279.6	24.34
.731	280.0	24.36
.750	281.0	24.17
1907.70	280.1	24.30

Probably unchanged. Measured by Doolittle in 1906.

12036. β 382. (6.0...8.0)

R. A. $22^h 48^m 18^s$ Decl. + 44° 7′

AB and C (10.7)

1911.720	354°.8	27″.41
.736	355.5	27.35
.775	354.8	27.35
1911.74	355.0	27.37

The apparent change appears to be due to a very small proper motion in AB. Further measures are necessary to give this a definite value.

Groombridge	0″.020	in	246°.4
Boss	0.016	in	270.0

12037. Σ 2952 *rej.* (7.5...10.5)

R. A. $22^h 48^m 28^s$ Decl. + 27° 23′

1911.698	136°.8	17″.44
.720	136.9	17.45
.736	136.7	17.35
1911.72	136.8	17.41

Probably fixed.

12038. OΣ (App.) 238. (6.5...7.2)

R. A. $22^h 48^m 28^s$ Decl. + 67° 21′

1910.815	280°.63	69″.06
.818	280.80	68.95
.838	280.88	68.96
1910.82	280.77	68.99

Unchanged since 1875. A third star should be connected. The principal star is given a small proper motion.

Schroeter 0″.070 in 104°.0

12042. Σ 2955 *rej.* (7.7...11.1)

R. A. $22^h 48^m 41^s$ Decl. + 6° 37′

1908.537	337°.7	22″.86
.556	337.8	22.95
.559	337.5	23.04
1908.55	337.7	22.95

Change doubtful.

12044. Σ 2954. (9.0...9.0)

R. A. 22^h 48^m 51^s Decl. + 14° 33′

1907.485	25°.15	38″.63
.502	25.38	38.73
.523	25.40	38.59
1907.50	25.31	38.65

One of these stars has a proper motion of about 0″.033.

A and DM (14°) 4889

1907.485	Δ Decl. 70″.0
.502	69.8

From these positions, compared with those in A. G. Leip., it would seem that the proper motion is in B.

12053. H 974. (8.7...9.7)

R. A. 22^h 49^m 20^s Decl. + 4° 11′

1911.698	87°.68	43″.83
.720	87.38	44.11
.755	87.52	44.18
1911.72	87.53	44.03

Further measures are necessary to confirm the supposed proper motion of A.

A. G. Alb. 0″.110 in 213°.7

12056. Σ 2956 *rej.* (9...10)

R. A. 22^h 49^m 44^s Decl. + 0° 42′

A and B

1910.490	158°.2	32″.06
.493	158.1	32.04
.529	158.1	31.83
1910.50	158.1	31.98

A and C

1910.490	278°.3	68″.27
.493	278.3	68.47
.529	278.2	68.16
1910.50	278.3	68.30

All the measures are of recent date. The magnitudes are from Herschel.

12058. β 383. (8.0...12.7)

R. A. 22^h 49^m 57^s Decl. + 8° 49′

A and C (12.4)

1910.490	240°.8	15″.64
.529	239.7	15.18
.570	240.0	16.04
.586	240.0	15.88
1910.54	240.1	15.68

No motion since 1877.

12063. Σ 2957. (8.6...10.4)

R. A. 22^h 50^m 26^s Decl. + 16° 49′

A and C (12.5)

1911.644	56°.76	131″.01
.663	57.01	131.17
.698	57.02	131.62
1911.67	56.93	131.27

For the proper motion of AB.

A. G. Ber. 0″.275 in 126°.6

12068. 16 *Lacertae.* Σ 2960. (6.0...12.0)

R. A. 22^h 50^m 55^s Decl. + 40° 58′

A and B

1912.581	345°.3	27″.40
.583	345.3	27.73
.619	345.2	27.55
1912.59	345.3	27.56

A and C (9.0)

1912.581	47°.65	62″.68
.583	47.53	62.89
.619	47.70	62.78
1912.59	47.63	62.78

A and B appear to be moving together as there is no sensible change since 1831, while C appears to be fixed in space. The four positions of AC by Σ, Δ and β (1831-1912) give for the proper motion of 16 *Lacertae:*

0″.013 in 13°.2

The meridian positions give a different direction, and discordant values of the annual motion.

Auwers	0″.029	in	258°.0
Boss	0.008	in	223.3

12078. β 452. (7.0...11.1)

R. A. 22^h 51^m 58^s Decl. + 42° 22′

A and C (15.0)

1911.777	15°.8	9″.83

A and D (13.8)

1911.777	212°.97	85″.47
.793	213.07	85.06
.813	214.07	86.22
1911.79	213.37	85.58

For the proper motion of A.

Greenwich 0″.049 in 78°.1

No other measures of C and D.

12082. H 3156. (10.9...11.1)

R. A. $22^h\ 52^m\ 13^s$ Decl. + 12° 28′

1910.838	298°.8	17″.50
.856	298.2	17.57
1910.85	298.5	17.53

No other measures.

H 3156 (A) and *h* 2194

1910.838	288°.4	134″.9

h 2194 is small, diffused, and with no definite center.

12087. H 3157. (10.5...11.0)

R. A. $22^h\ 52^m\ 26^s$ Decl. + 53° 42′

1910.815	37°.6	15″.10

This is probably the pair referred to by Herschel. It is in *h* 2196 which is made up principally of 10 m and smaller stars.

12090. OΣ 536. (7.0...7.5)

R. A. $22^h\ 52^m\ 30^s$ Decl. + 8° 43′

AB and C (9.6)

1909.589	84°.28	239″.13
.592	84.33	239.04
.627	84.32	238.48
.666	84.40	239.23
1909.62	84.33	238.97

C and D (11.0)

1909.666	218°.00	115″.60
.687	217.92	115.69
1909.68	217.96	115.64

From the three measures of C by OΣ, HΣ and β (1852-1909) the proper motion of the binary is:

0″.412 in 112°.2

The proper motion of the system from the star catalogues is given:

Porter	0″.397	in	111°.5
Kustner	0.397	in	110.5
Glasgow	0.399	in	109.9
Paris	0.408	in	112.0
Boss	0.421	in	111.0

No other measures of CD.

12121. Σ 2972 *rej.* (9.3...11.7)

R. A. $22^h\ 56^m\ 34^s$ Decl. — 0° 23′

1910.436	142°.6	15″.76
.452	143.6	15.87
.490	143.6	15.75
1910.46	143.3	15.79

Change is certain; probably a small proper motion in A. The complete measures are of recent date. No third star suitable.

12125. 2 *Andromedae*. β 1147. (5.0...8.7)

R. A. $22^h\ 57^m\ 5^s$ Decl. + 42° 7′

AB and C (13.6)

1911.777	191°.73	90″.23
.793	191.33	90.63
.813	191.80	90.79
1911.79	191.62	90.55
1912.622	192°.20	89″.95
.638	191.93	90.27
.657	191.90	90.35
1912.63	192.01	90.19

No other measures of the faint star. The proper motion of the binary is given in the star catalogues:

Auwers	0″.041	in	109°.8
Groombridge	0.065	in	99.8
Boss	0.062	in	96.5

12130. OΣ 485 *rej.* (6.0...9.0)

R. A. $22^h\ 57^m\ 34^s$ Decl. + 54° 35′

A and B

1911.736	50°.0	20″.75
.775	50.8	20.81
.777	50.9	20.73
1911.76	50.6	20.76

Some change from proper motion in A.

A. G. Harv. 0″.015 in 270°.0

A and C (9.5)

1911.736	80°.43	56″.41
.775	79.90	56.35
.777	80.35	56.60
1911.76	80.23	56.45

No other complete measures of this. There is an error of 180° in the angle of AC by Madler.

12134. β *Pegasi*. H 1842. (2.2...11.1)

R. A. $22^h\ 57^m\ 56^s$ Decl. + 27° 26′

A and B

1910.452	209°.88	105″.81
.471	209.43	105.01
.473	209.80	105.17
1910.47	209.70	105.33

A and C

1910.471	97°.50	255″.10
.473	97.55	256.08
.490	97.53	255.42
1910.48	97.53	255.53

For the proper motion of β *Pegasi* we have:

Measures of B	0″.243	in	52°.1
Measures of C	0.224	in	47.8
Auwers	0.218	in	52.5
Greenwich	0.218	in	52.4
Newcomb	0.236	in	55.1
Boss	0.233	in	55.2

The measures of the small stars should be continued.

12170. OΣ 488 *rej.* (7.0...10.7)

R. A. $23^{h}\ 1^{m}\ 31^{s}$ Decl. + 19° 56′

1910.780	334°.2	13″.87
.838	333.6	14.05
.856	335.2	14.00
1910.82	334.3	13.97

No sensible change since 1865.

12171. β 1025. (8.0...10.8)

R. A. $23^{h}\ 1^{m}\ 38^{s}$ Decl. + 12° 1′

AB and C (11.9)

1909.760	83°.95	21″.75
.763	83.75	21.56
.780	83.94	22.14
.782	84.24	21.85
1909.77	83.97	21.83

h 2214 and star 12.7 m

1909.760	227°.45	120″.25
.763	227.05	119.95
.780	228.07	119.64
.782	226.90	120.15
1909.77	227.37	120.00

The last is 4^{m} exactly following β 1025; small, diffused and some brighter in the middle, and bisection fairly accurate.

12172. Σ 2976. (8.3...10.2)

R. A. $23^{h}\ 1^{m}\ 38^{s}$ Decl. + 5° 57′

C and D (8.8...12.2)

1908.750	247°.80	132″.12
.785	247.97	131.98
.788	248.15	131.12
.804	247.90	131.57
1908.78	247.95	131.70

This measured to show whether or not C has any proper motion.

The apparent motion of A from the measures of AC (1828-1905) is:

0″.054 in 253°.1

12179. 4 *Andromedae.* H 1849. (5.6...10.6)

R. A. $23^{h}\ 2^{m}\ 10^{s}$ Decl. + 45° 44′

1909.818	346°.80	47″.86
.821	346.63	47.86
.838	347.18	47.84
1909.83	346.87	47.85

As the first measure of this is on a single night, relative motion is uncertain. The measures should be continued. The proper motion of A is small:

Auwers	0″.031	in	193°.9
Groombridge	0.054	in	210.2
Boss	0.030	in	189.9

12180. H 979. (8.5...10.2)

R. A. $23^{h}\ 2^{m}\ 21^{s}$ Decl. + 21° 28′

1911.583	216°.9	18″.48
.644	217.8	18.30
.663	218.0	18.47
1911.63	217.6	18.42

Probably unchanged. Herschel's distance in 1830 was too small.

12184. Σ 2984. (7.5...10.0)

R. A. $23^{h}\ 2^{m}\ 58^{s}$ Decl. + 70° 1′

A and C (13.0)

1911.545	81°.67	75″.41
.564	81.63	74.32
.567	80.90	74.60
1911.56	81.40	74.78

For verification of the proper motion.

Schroeter 0″.068 in 147°.8

12196. π *Cephei.* OΣ 489. (5.2...7.5)

R. A. $23^{h}\ 4^{m}\ 5^{s}$ Decl. + 74° 44′

AB and C (12.8)

1911.602	240°.90	58″.57
.622	240.37	58.23
.625	239.97	58.88
.644	240.43	58.59
1911.62	240.42	58.57

The only other measures of the Herschel companion are my own. Later observations are necessary for correction of the proper motion of π *Cephei.*

Auwers	0″.037	in	180°.5
Newcomb	0.033	in	164.8
Boss	0.028	in	154.8

12202. 2 *Cassiopeiae*. S 823. (6.0...9.4)

R. A. $23^h\,4^m\,37^s$ Decl. + 58° 41′

1912.675	162°.89	167″.11
.695	162.95	167.07
.698	162.90	167.13
1912.69	162.91	167.10

The β measures (1881-1912) of the small star, which is too faint for the DM, give for the proper motion of 2 *Cassiopeiae:*

0″.041 in 152°.0

This will be confirmed hereafter by observations of the 20″ companion first measured in 1904. The motion from transit positions is very uncertain:

Auwers	0″.007	in	173°.6
Davis	0.009	in	175.0
Groombridge	0.018	in	319.8
Boss	0.014	in	344.5

12205. β 852. (7.0...)

R. A. $23^h\,4^m\,51^s$ Decl. + 25° 52′

A and BC

1912.504	283°.07	58″.36
.507	282.55	58.15
.526	282.63	58.17
1912.51	282.75	58.23

There is no apparent change in the position of the double companion since 1881.

12214. Ho 197. (8.0...8.3)

R. A. $23^h\,5^m\,44^s$ Decl. + 37° 24′

AB and C (9.4)

1907.879	328°.42	41″.13
8.460	328.48	40.76
8.482	328.27	40.98
1912.675	328.12	41.05
.695	328.13	41.02
.698	328.00	40.77

AB and D (10.0)

1907.879	280°.48	49″.78
8.460	280.48	49.63
8.482	280.67	49.84
1912.675	280.40	50.08
.695	280.28	50.16
.698	280.33	50.15

C is DM (37°) 4984. The measures of the distant stars are conflicting in distance, and change is uncertain. The following are all the measures:

AB and C

1894.79	329°.5	42″.56	1n	Ho
1906.68	329.1	41.67	2n	Doo
1908.27	328.39	40.96	3n	β
1912.69	328.08	40.95	3n	β

AB and D

1894.79	281°.3	47″.30	1n	Ho
1906.68	279.7	50.27	2n	Doo
1908.27	280.54	49.75	3n	β
1912.69	280.34	50.13	3n	β

12222. H 3176. (9.2...9.2)

R. A. $23^h\,6^m\,52^s$ Decl. + 11° 54′

1910.529	164°.4	26″.94
.570	164.5	26.84
.586	164.5	26.93
1910.56	164.5	26.90

No early measures of this.

h 2214 and star 12.6 m

1910.529	227°.2	120″.9
.586	227.2	120.1
1910.56	227.2	120.5

h 2214 is about 15′ n of H 3176.

12229. Σ 2992. (7.5...9.2)

R. A. $23^h\,7^m\,24^s$ Decl. + 39° 21′

A and B

1910.684	285°.3	14″.43
.698	285.2	14.03
.701	285.1	14.15
1910.69	285.2	14.20

Apparently without change.

A and C (13.5)

1910.684	343°.95	50″.72
.701	343.30	51.51
.703	342.65	50.94
1910.70	343.30	51.06

For the proper motion of A.

Greenwich	0″.084	in	101°.1

12230. Σ 2991 *rej.* (7.0...10.0)

R. A. $23^h\,7^m\,24^s$ Decl. + 10° 25′

1911.813	358°.1	32″.92
1.835	358.3	33.59
1.870	359.1	33.06
2.810	358.7	33.45
2.813	359.3	33.47
2.829	358.8	33.70
1912.33	358.7	33.36

No early measures.

12234. Σ 2993. (7.0...7.8)

R. A. $23^{h} 7^{m} 47^{s}$ Decl. — 9° 35′

A and C (9.1)

1908.556	115°.26	121″.88
.573	115.45	122.50
.597	115.70	122.49
1908.58	115.47	122.29

C is SD (9°) 6152. From the measures of AC the proper motion of AB is:

0″.461 in 89°.4

From the catalogues:

Paris	0″.569	in	103°.0
Boss	0.558	in	94.7

Later measures of AC:

1911.663	115°.85	121″.25
.720	115.63	121.11
.736	115.60	121.40
1911.71	115.69	121.25

12236. H 981. (9.0...12.5)

R. A. $23^{h} 7^{m} 51^{s}$ Decl. + 2° 13′

1908.482	281°.0	17″.85
.559	279.4	17.89
.573	281.4	17.94
1908.54	280.6	17.89

This pair was wrongly identified in 1905, and the measure given in Part II of the *General Catalogue* belongs to another star.

12237. β 714.

R. A. $23^{h} 7^{m} 56^{s}$ Decl. — 3° 17′

h 2220 is about 28′ distant *nf;* diffused, and little brighter in the middle.

h 2220 and SD (3°) 5598

1910.589	83°.1	165″.86
.608	82.6	166.35
1910.60	82.8	166.10

12247. H 983. (8.7...9.2)

R. A. $23^{h} 8^{m} 35^{s}$ Decl. + 31° 7′

1910.684	156°.3	16″.83
.698	158.1	17.04
.701	157.4	16.68
1910.69	157.3	16.85

There is a 13.5 m star, 318°.8: 20″.7 from A

12257. ψ^1 *Aquarii.* β 1220.

R. A. $23^{h} 9^{m} 36^{s}$ Decl. — 9° 44′

BC and E (9.0...12.5)

1908.597	358°.1	18″.31
.633	357.7	18.46
.671	357.3	18.29
1908.63	357.7	18.35

Rejecting my single measure in 1877, the three positions give for the proper motion of BC, which is exactly the same as that of ψ^1 *Aquarii:*

0″.375 in 89°.4

From meridian positions, we have for ψ^1 *Aquarii:*

Auwers	0″.350	in	90°.8
Boss	0.367	in	92.0
Porter	0.348	in	92.1
Paris	0.378	in	72.6

12265. Σ 2995. (7.7...8.0)

R. A. $23^{h} 10^{m} 24^{s}$ Decl. — 2° 15′

1910.684	31°.2	4″.76
.701	32.3	4.89
.703	29.5	4.95
1910.70	31.0	4.87

No change; the position-angle by Σ is too small. The Hd pair could not be found.

12267. H 3181. (9.1...10.0)

R. A. $23^{h} 10^{m} 27^{s}$ Decl. + 52° 19′

A and B

1909.742	18°.8	22″.17
.744	19.3	22.18
.760	18.9	22.21
1909.75	19.0	22.19

A and DM (52°) 3407 (9.0)

1909.742	49°.20	153″.81
.744	49.10	154.05
.760	48.78	153.89
1909.75	49.03	153.92

The positions of the distant star seem to indicate that if A has any proper motion at all, it is in a direction opposite that given in A. G. Harvard as 0″.101 in 90°.0.

1875	49°.3	152″.3	A. G. Harv.

12272. H 3180. (9.4...12.2)

R. A. $23^{h} 10^{m} 37^{s}$ Decl. + 9° 37′

1908.636	265°.0	23″.01
.652	263.7	23.05
.671	263.4	23.07
1908.65	264.0	23.04

No other measures. Herschel's angle in 1830 was 253°.1.

12274 β 182. (8.7...8.9)

R. A. $23^h 10^m 52^s$ Decl. — 14° 28′

AB and C (12.5)

1908.750	71°.34	76″.10
.824	71.12	75.46
.826	71.28	75.54
.882	71.83	75.80
1908.82	71.39	75.73
1910.760	70°.83	77″.24
.838	69.31	77.53
.931	70.18	78.04
1910.84	70.11	77.60

I have given in the *General Catalogue* the proper motion of AB from the measures of C (1898-1903). A continuation of these measures will reduce the error.

1″.306 in 199°.0

AB and D

1910.760	167°.20	147″.35
.780	167.10	146.97
.818	166.70	146.92
1910.79	167.00	147.08

With the position of D in 1902, the proper motion of A is:

1″.353 in 207°.2

At present, because of the longer time interval, the value from the measures of C should be the best.

Porter	1″.302	in	201°.2
Romberg	1.297	in	200.4
Radcliffe	1.331	in	202.5

12285. 8 *Andromedae.* β 717. (5.0...13.0)

R. A. $23^h 12^m 11^s$ Decl. + 48° 22′

A and C (10.3)

1908.826	130°.61	219″.28
.845	131.04	219.37
.862	130.95	219.41
1908.84	130.87	219.35

The following is the only prior observation:

1880.28 130°.67 219″.41 2n Bl

The proper motion, if any, of 8 *Andromedae* is small and uncertain:

Auwers	0″.024	in	119°.8
Boss	0.038	in	81.0

12289. 95 *Aquarii.* Ho 199. (5.2...11.5)

R. A. $23^h 12^m 43^s$ Decl. — 10° 16′

A and C (13.1)

1912.562	231°.35	129″.63
.695	230.40	130.11
.752	230.10	130.52
1912.67	230.46	130.06

For the proper motion of AB. No other measures.

Auwers	0″.023	in	70°.1
Boss	0.047	in	87.6

12290. β 80. (8.2...9.1)

R. A. $23^h 12^m 45^s$ Decl. + 4° 45′

AB and C (10.8)

1906.753	2°.0	103″.87
6.755	1.7	104.03
7.562	2.1	103.81
7.638	1.8	104.01
7.657	1.7	103.98
1907.27	1.86	103.94
1910.838	1°.08	104″.14
.856	0.73	104.15
.893	1.21	104.03
1910.86	1.01	104.11

AB and D (9.5)

1906.753	331°.4	188″.55
6.755	331.3	188.10
7.638	331.2	188.88
7.657	331.3	188.66
1907.20	331.30	188.55
1910.838	331°.15	190″.12
.856	331.00	189.50
.893	331.35	190.08
1910.86	331.17	189.90

From all the measures of the faint stars (1891-1910) we have for the proper motion of the binary system:

AC	R. A. + 0″.414	Decl. — 0″.032
AD	0.468	0.113
	+ 0.441	— 0.072

Therefore the corrected proper motion of β 80 is:

0″.447 in 99°.3

Some of the values from the catalogues are:

Stumpe	0″.534	in	102°.3
Boss	0.509	in	101.2
Porter	0.480	in	100.5
Paris	0.520	in	103.6

12296. 96 *Aquarii.* H 5394. (6.3...11.2)

R. A. $23^h 13^m 10^s$ Decl. — 5° 47′

1910.742	21°.9	10″.46
.760	23.6	10.55
.777	22.5	10.44
1910.76	22.7	10.48

No suitable third star for proper motion. B has the same motion as the bright star.

Auwers	0″.166	in	89°.3
Paris	0.191	in	90.0
Boss	0.193	in	94.7

12304. o *Cephei.* Σ 3001. (5.2...7.8)

R. A. $23^h\ 13^m\ 41^s$ Decl. + 67° 27′

A and C (13.1)

1912.408	3°.90	45″.54
.411	4.70	45.50
.427	3.00	45.62
1912.41	3.87	45.55

No other measures of C. The small relative motion in AB implies a system of the 61 *Cygni* class.

For the proper motion of the large star we have:

Auwers	0″.054	in	83°.6
Schroeter	0.059	in	85.1
Boss	0.066	in	75.0

12305. OΣ (App.) 244. (6.0...9.3)

R. A. $23^h\ 14^m\ 3^s$ Decl. + 47° 43′

1910.473	301°.05	84″.56
.509	300.97	84.64
.531	301.18	84.45
1910.50	301.07	84.55

The proper motion of the principal star from all the measures to 1910, and from meridian positions, not cited in the *General Catalogue* is:

Measures	0″.225	in	78°.0
Auwers	0.174	in	73.3
Boss	0.206	in	81.3

For a further independent value of this motion, I have measured a third small star:

A and C (11.0)

1910.509	104°.25	136″.47
.548	104.37	136.41
1910.53	104.31	136.44

12317. Σ 3006. (8.5...9.0)

R. A. $23^h\ 15^m\ 24^s$ Decl. + 34° 47′

A and B

1912.465	165°.2	5″.69
.507	165.0	5.62
1912.49	165.1	5.65

One of the components of Σ 3006, presumably the brighter one, has a proper motion of 0″.023 in 276°.1. To make certain which it is, I have connected a faint star.

A and C (11.2)

1912.465	18°.71	77″.90
.504	18.68	78.18
.507	18.73	78.09
1912.49	18.71	78.06

12320. H 3185 = *h* 2234.

R. A. $23^h\ 15^m\ 36^s$ Decl. + 8° 14′

h 2234 and star 13.3 m

1909.760	163°.3	21″.55
.763	161.8	21.41
1909.76	162.5	21.48

There is no star in the nebula.

12325. 64 *Pegasi.* β 718. (5.0...8.7)

R. A. $23^h\ 16^m\ 3^s$ Decl. + 31° 9′

AB and C (13.0)

1912.504	146°.75	112″.90
.507	147.07	112.89
.526	146.90	112.80
1912.51	146.91	112.86

For the proper motion of the binary system. From the catalogues we have:

Auwers	0″.020	in	144°.2
Boss	0.023	in	156.8

12332. Σ 3007. (6.5...9.5)

R. A. $23^h\ 16^m\ 46^s$ Decl. + 19° 54′

A and C (11.0)

1909.802	319°.27	78″.23
.818	319.25	77.98
.821	319.26	78.59
1909.81	319.26	78.27
1911.602	319°.20	78″.79
.622	318.90	78.65
.644	319.01	78.78
1911.62	319.04	78.74

These measures do not sensibly change the proper motion of A given in the *General Catalogue* from the measures to 1905. With the later positions this motion is:

0″.287 in 86°.1

The motion from meridian positions appears to be too large:

Paris	0″.337	in	90°.0
Boss	0.319	in	93.4

12336. H 3188. (9.0...11.5)

R. A. $23^h\ 17^m\ 8^s$ Decl. + 11° 47′

1910.490	249°.1	20″.87
.493	249.3	21.20
.570	247.3	20.97
1910.52	248.6	21.01

No early measures. About 4^m *f* H 3188, same declination, is *h* 2242. The Rosse nebula near this was not seen.

h 2242 and DM (11°) 5002 (9.5)

1910.586	263°.28	127″.40
.589	264.02	126.68
1910.59	263.65	127.04

There is an error in the Strasburg R. A.

1897.93 263°.7 126″.60 Kobold.

12338. H 5397. (7.0...8.3)

R. A. $23^h 17^m 24^s$ Decl. — 15° 8′

1910.608	337°.15	65″.73
.627	337.23	65.82
.644	336.98	65.56
1910.63	337.12	65.70

One of these stars has some proper motion. From the measures by Gla and β (1892-1910) the apparent proper motion of the larger star is:

0″.128 in 230°.4

A third star should be connected with A or B.

12343. Σ 3010. (8.0...8.7)

R. A. $23^h 17^m 45^s$ Decl. + 45° 8′

B and C (12.2)

1910.605	104°.8	27″.75
.608	104.5	27.93
.628	104.7	28.57
1910.61	104.7	28.08

C not moving with the others. The measures are too recent to give an accurate value of the motion of AB.

Stumpe	0″.172	in	95°.0
Argelander	0.191	in	93.0
Kustner	0.167	in	98.2
Porter	0.169	in	90.0

12351. H 5398. (9.4...9.6)

R. A. $23^h 19^m 2^s$ Decl. — 17° 54′

1908.633	4°.0	29″.43
.671	3.4	29.16
.750	3.1	29.40
1908.68	3.5	29.33

This is SD (18°) 6306. The place in Part I of the *General Catalogue* is substantially correct. No other measures.

12353. H 3192. (9.4...9.7)

R. A. $23^h 19^m 27^s$ Decl. — 17° 35′

1908.633	116°.6	27″.30
.671	116.3	27.23
.750	116.6	26.96
1908.68	116.5	27.16

No other measures.

12354. 4 *Cassiopeiae.* (5.2...8.5)

R. A. $23^h 19^m 30^s$ Decl. + 61° 37′

A and C (9.5)

1912.526	257°.60	215″.23
.545	258.15	215.11
.562	258.42	215.05
1912.54	258.09	215.13

C and D (10.5)

1912.526	37°.0	9″.63
.545	38.6	9.03
.562	37.7	9.58
1912.54	37.8	9.41

The only other measures are my own. The proper motion of 4 *Cassiopeiae* is uncertain:

Auwers	0″.017	in	158°.1
Groombridge	0.027	in	125.6
Newcomb	0.010	in	196.8
Boss	0.014	in	123.5

12361. H 3193. (9.5...10.1)

R. A. $23^h 20^m 2^s$ Decl. — 12° 18′

1908.573	218°.3	34″.34
.633	217.8	34.55
.636	218.5	34.56
1908.61	218.2	34.48

Only the measures of 1892.

12363. Ho 489. (8.0...8.0)

R. A. $23^h 20^m 4^s$ Decl. + 27° 3′

AB and C (7.5)

1910.608	194°.83	63″.23
.627	194.85	63.37
.644	194.94	63.20
1910.63	194.87	63.27

No change in the wide pair since 1875.

h 2240 and star 10.5 m

1910.586	271°.2	101″.5
.608	270.6	100.5
.644	271.7	102.9
1910.61	271.2	101.6

h 2240 is about 40′ *s* of Ho 489.

1887.80 271°.3 102″.8 Eng

12365. H 1877. (12.4...14.8)

R. A. $23^h 20^m 6^s$ Decl. + 41° 52′

A and B

1908.482	357°.4	20″.12
.575	356.0	20.44
.636	357.0	19.85
1908.56	356.8	20.14

H 1877 (A) and *h* 2241

1908.444	243°.3	50″.07
.482	243.6	50.38
.518	243.4	50.66
1908.48	243.4	50.37

This is a well known planetary nebula (Dreyer 7662) with the minute star in the center, which is characteristic of all nebulae of this class. The central star was rated 15 m in my measures at Mt. Hamilton. This, like many of the central stars in the planetary nebulae, and similar attendants to bright stars, is a test of atmosphere rather than aperture, and at times is beyond the reach of the largest telescopes. On the occasion of the foregoing measures it was not well seen owing to the unsteady condition of the air. The prior measures of *h* 2241 and the principal star of H 1877 will be found in Pub. L. O. II p. 167. There is no suggestion of any change in the last fifty years.

12366. See 485. (6.7...12.2)

R. A. $23^h\ 20^m\ 16^s$ Decl. — 22° 24′

1908.671	131°.3	5″.03
.826	129.6	5.15
1908.75	130.4	5.09

The proper motion of the large star is given:

Boss 0″.036 in 85°.2

12369. ϰ Piscium. S 830. (5.0...10.6)

R. A. $23^h\ 20^m\ 46^s$ Decl. + 0° 36′

A and B

1907.540	344°.13	160″.91
.559	344.25	161.33
.562	344.25	161.05
1907.55	344.21	161.10

For the proper motion of the principal star.

Measures of AB	0″.169	in	152°.0
Auwers	0.109	in	144.7
A. G. Nico.	0.119	in	148.9
Boss	0.124	in	136.5

B and *a* (13.2)

1907.540	153°.7	75″.92
.675	154.2	76.50
.731	153.6	76.00
1907.65	153.8	76.14

No other measures of the small star.

12372. β 386. (6.5...11.9)

R. A. $23^h\ 21^m\ 13^s$ Decl. + 70° 1′

A and B

1907.351	313°.6	19″.91
.444	313.2	19.77
.463	312.8	19.72
1907.42	313.2	19.80
1910.720	313°.03	20″.06
.739	312.50	19.68
.760	313.28	19.74
1910.74	312.94	19.83

The proper motion of A is uncertain in direction and amount; I have therefore connected a third faint star.

A and C (12.1)

1907.351	202°.9	46″.88
.444	203.3	46.37
.463	203.0	46.71
1907.42	203.1	46.65
1910.720	203°.50	46″.63
.739	202.93	46.28
.760	203.48	46.23
1910.74	203.30	46.38

A. G. Chris.	0″.026	in	96°.7
Battermann	0.013	in	40.9
Schroeter	0.026	in	57.0
Boss	0.053	in	40.9

12381. Σ 3014. (8.1...10.4)

R. A. $23^h\ 21^m\ 52^s$ Decl. + 10° 29′

1907.540	280°.2	8″.10
.562	281.8	7.91
.657	281.7	8.01
1907.59	281.2	8.01

There appears to be a slight increase in the distance.

12384. OΣ (App.) 246. (7.3...8.2)

R. A. $23^h\ 21^m\ 58^s$ Decl. + 22° 55′

A and B

1907.810	114°.33	86″.74
.845	114.23	86.80
.865	114.45	86.80
1907.84	114.34	86.78
1911.602	114°.53	86″.81
.622	114.41	87.03
.625	114.70	87.48
1911.62	114.55	87.11

A and C (10.9)

1907.845	156°.38	135″.47
7.865	156.68	135.82
8.479	156.47	135.51
1908.06	156.51	135.60

B and C

1907.845	195°.35	92″.41
7.865	195.68	92.02
8.479	195.93	92.57
1908.06	195.65	92.33

1911.602	196°.45	92″.93
.622	195.83	91.68
.625	195.80	92.43
1911.62	196.03	92.38

The third star is connected to get hereafter the separate proper motions of the large stars. This is given by Rechenberg:

A	0″.067	in	115°.5
B	0.020	in	310.5

The apparent motion of A from the measures of B (1875-1903) is:

0″.122 in 116°.0

12393. H 311. (10.7...11.8)

R. A. 23^{h} 22^{m} 57^{s} Decl. + 16° 40′

A and B

1909.534	289°.1	21″.60
.630	291.4	21.18
.703	291.7	21.79
1909.62	290.7	21.52

H 311 (A) and *h* 2247

1909.534	229°.3	145″.49
.630	229.6	145.36
.703	229.0	145.31
1909.62	229.3	145.39

The only other measures, in 1904, are given in the *General Catalogue*. *h* 2247 is the object referred to by Herschel in his note on H 311.

12398. H 987. (9.5...11.0)

R. A. 23^{h} 23^{m} 44^{s} Decl. + 31° 34′

1910.452	281°.0	13″.49
.473	281.8	13.50
.586	282.9	13.41
1910.50	281.9	13.47

h 2246 is 20′ *np* H 987; faint, diffused and small.

h 2246 and star 13.5 m

1910.452	178°.2	41″.01

12400. H 3197. (9.7...9.8)

R. A. 23^{h} 23^{m} 51^{s} Decl. — 17° 57′

1908.633	309°.3	8″.20
.671	308.9	8.19
.750	307.8	8.29
1908.68	308.7	8.23

Apparently unchanged.

12411. Σ 3022. (8.0...9.7)

R. A. 23^{h} 25^{m} 9^{s} Decl. + 57° 45′

A and β 1151 (9.6)

1910.815	189°.70	116″.80
.818	189.73	117.16
.838	189.98	116.96
1910.82	189.80	116.97

No change since 1889.

12415. OΣ 498 *rej.* (7.2...10.0)

R. A. 23^{h} 25^{m} 38^{s} Decl. + 51° 45′

1910.684	244°.3	17″.08
.698	243.4	17.04
.701	242.8	17.18
1910.69	243.5	17.10

The proper motion from A. G. Harvard of 0″.075 in 90° is probably incorrect, as the distance of the 10 m star should increase more than 3″ since 1866.

12434. Σ 60, App. I. (6.4...6.5)

R. A. 23^{h} 28^{m} 1^{s} Decl. + 59° 47′

As it is uncertain which, if only one, of these large stars has the proper motion, I have measured a faint star from each.

A and *a* (10.2)

1910.471	136°.07	135″.19
.473	135.95	135.00
.548	135.93	135.10
1910.50	135.98	135.10

B and *b* (11.8)

1910.471	309°.23	82″.63
.473	309.12	82.09
.548	309.47	82.69
1910.50	309.27	82.47

The apparent motion of A from the measures of AB (1835-1904) is:

0″.091 in 78°.4

No proper motion found in the several star catalogues examined.

12441. β 388. (6.5...12.0)

R. A. 23^{h} 28^{m} 52^{s} Decl. + 37° 22′

1908.520	333°.1	20″.33
.575	333.4	20.17
.594	333.4	20.24
1908.56	333.3	20.25

Apparently a little change from proper motion. Nothing found in the star catalogues referred to.

12465. H 316. (6.9...10.8)

R. A. $23^h\ 31^m\ 27^s$ Decl. — 13° 44′

1909.534	94°.0	33″.07
.570	93.0	32.78
.666	93.2	32.80
1909.59	93.4	32.88

h 2261, which is 77^s *f* and 7′ *n* of H 316, is fairly bright in the center.

h 2261 and star 12.6 m

1909.534	224°.43	155″.23
.570	224.65	153.56
1909.55	224.54	154.39

12467. H 3208. (9.5...9.6)

R. A. $23^h\ 31^m\ 35^s$ Decl. + 8° 50′

1907.657	153°.9	11″.94
.673	153.8	11.75
.675	153.4	12.06
1907.67	153.7	11.92

No other measures.

12468. OΣ 500. (6.1...7.0)

R. A. $23^h\ 31^m\ 40^s$ Decl. + 43° 46′

AB and C (10.7)

1912.583	335°.10	115″.87
.619	334.93	116.13
.622	334.96	115.52
1912.61	334.50	115.84

No other measures of C. The close pair is a long period binary. The only proper motion found for the large star is the following:

Greenwich 0″.038 in 100°.5

12479. Σ 3028. (7.0...9.5)

R. A. $23^h\ 32^m\ 37^s$ Decl. + 34° 22′

1911.471	202°.6	17″.48
.509	203.8	17.34
.529	202.7	17.42
1911.50	203.0	17.41

From six positions by Σ, Δ, En, Hu and β on 21 n (1829-1911) the motion of the principal star is:

0″.028 in 224°.5

12481. H 5411. (9.4...9.6)

R. A. $23^h\ 32^m\ 46^s$ Decl. — 2° 46′

1907.657	41°.7	16″.28
.673	41.1	16.49
.675	41.6	16.44
1907.67	41.5	16.40

Probably unchanged.

12495. Espin 149. (8.3...8.5)

R. A. $23^h\ 34^m\ 18^s$ Decl. + 63° 39′

1907.636	120°.7	5″.80
.638	121.1	5.65
.695	121.8	5.53
1907.66	121.2	5.66

No other complete measures.

12497. *κ Andromedae.* H 1898. (4.3...11.0)

R. A. $23^h\ 34^m\ 30^s$ Decl. + 43° 40′

A and B

1909.742	191°.95	46″.46
.744	192.23	46.90
.760	192.28	46.91
1909.75	192.15	46.76

A and C (11.0)

1909.742	294°.38	105″.41
.744	294.33	105.57
.760	294.29	105.58
1909.75	294.33	105.52

From the three sets of measures of the small stars (1879-1909) we have the proper motion of A:

AB	R. A. + 0″.091	Decl. — 0″.013
AC	0.077	0.017
	+ 0.084	— 0.015

Hence the most probable motion of A is:

0″.085 in 100°.1

From transit positions:

Newcomb	0″.088	in	106°.1
Auwers	0.075	in	110.3
Boss	0.083	in	106.9

12501. Ho 303. (8.0...11.0)

R. A. $23^h\ 34^m\ 45^s$ Decl. + 19° 42′

A and C (11.2)

1912.504	3°.33	102″.12
.507	3.28	101.77
.526	3.07	101.94
1912.51	3.23	101.94

The proper motion of the principal star is said to be:

A. G. Ber. 0″.220 in 74°.2

No other measures of C.

12510. β 389. (7.7...8.2)

R. A. 23^h 35^m 18^s Decl. + 31° 54′

AB and C (12.8)

1908.692	51°.7	23″.21
9.666	52.0	23.31
9.706	52.6	23.34
1909.35	52.1	23.29

No material change in this since 1881, and it is therefore certain that the binary has no sensible proper motion.

12517. OΣ 503. (7.2...7.8)

R. A. 23^h 35^m 59^s Decl. + 19° 38′

A and C (13.8)

1911.644	233°.46	38″.21
.663	233.38	37.86
.720	233.98	37.52
1911.67	233.61	37.86

Very faint star for the proper motion of AB. No other measures.

A. G. Ber. 0″.103 in 237°.0

12523. ω² *Aquarii.* β 279. (5.0...11.0)

R. A. 23^h 36^m 30^s Decl. — 15° 12′

1910.760	85°.8	5″.77
.818	84.8	5.34
.838	85.0	5.38
1910.81	85.2	5.50

No third star near enough. The companion is moving with the other. The proper motion of the large star is:

Auwers	0″.091	in	131°.4
Boss	0.106	in	124.6

12536. Espin 150. (9.8...10.7)

R. A. 23^h 38^m 24^s Decl. + 64° 23′

1907.807	33°.0	3″.23
.810	32.1	3.76
.845	33.9	3.23
1907.82	33.0	3.41

Error of 180° in angle by Espin.

12538. H 3211. (8.9...9.0)

R. A. 23^h 38^m 50^s Decl. + 3° 6′

1910.586	82°.65	47″.89
.589	83.05	48.41
.605	82.86	48.43
1910.59	82.85	48.24

One of these stars has a proper motion of about 0″.29 in 238° (± 180°). The measures should be continued, and a third star connected.

h 2267 is 1^m 40^s directly *f* H 3211.

h 2267 and star 10.8 m

1910.589	104°.5	189″.1

12552. Σ 3039. (7.3...9.7)

R. A. 23^h 40^m 49^s Decl. + 27° 45′

A and B

1910.605	33°.2	32″.41
.608	33.0	32.92
.628	33.2	32.81
1910.61	33.1	32.71

There is no third near star for the micrometer.

A and DM (27°) 4621

1910.32	Δ R. A. 53^s.34	Δ Decl. 46″.7	β
1875	53.35	48.1	A. G. Camb.

These positions tend to prove that the proper motion of A is in Declination, as shown from the measures of AB, and not in R. A. as given from meridian positions.

Measures of AB	0″.038	in	174°.0
Kustner	0.026	in	272.1

12559. β 727. (7.0...12.5)

R. A. 23^h 41^m 26^s Decl. + 24° 55′

1912.755	316°.1	16″.94
.791	314.5	16.65
.793	316.1	16.88
1912.78	315.6	16.82

No change in the position of the small star unless a small advance in the angle.

12561. β 390. (8.3...11.8)

R. A. 23^h 41^m 33^s Decl. + 48° 38′

1911.698	.....	17″.29
.775	232°.7	17.00
.777	232.1	16.90
1911.75	232.4	17.06

Change uncertain.

12563. Σ 3041. (7.3...8.2)

R. A. $23^h 41^m 45^s$ Decl. + 16° 25′

A and B

1907.597	351°.5	63″.78
.657	351.5	63.95
.673	351.4	63.87
1907.64	351.47	63.87

A and C (8.1)

1907.597	352°.1	67″.17
.657	351.8	67.46
.673	352.0	67.16
1907.64	351.97	67.26

These positions with the three prior measures of A and BC (1832-1907) give for the apparent proper motion of BC:

0″.099 in 128°.2

From meridian positions:

A	0″.031	in	33°.6	A. G. Ber
	0.040	in	20.7	Rechenberg
BC	0.106	in	124.4	A. G. Ber
	0.096	in	118.5	Rechenberg

It is at least probable that the change is wholly due to the motion of BC.

12564. 20 *Piscium.* S 835. (5.8...8.6)

R. A. $23^h 41^m 46^s$ Decl. — 3° 26′

A and B

1911.663	284°.88	173″.22
.720	285.25	172.70
.755	285.00	172.74
1911.71	285.04	172.89

A comparison of the position by South in 1824 with the measures of 1900 and 1911, implies a motion in A of 0″.082 in 32°.7, but owing to the uncertainty of the early distances, and the possibility of some motion in B, this result should be confirmed by further observations. I have therefore connected a faint star with B.

B and C (12.5)

1911.775	277°.89	52″.35
.777	278.10	52.02
.813	277.73	52.17
1911.79	277.91	52.18

From the star catalogues:

Auwers	0″.072	in	87°.6
Boss	0.095	in	86.4

12567. Σ 3040. (9.0...9.0)

R. A. $23^h 42^m 0^s$ Decl. + 9° 29′

1909.725	218°.0	4″.39
.742	218.2	4.37
.744	218.0	4.43
1909.74	218.1	4.40

h 2265 and star 11.9 m

1909.703	104°.8	70″.1
.706	103.7	71.3
.760	105.8	69.8
1909.72	104.8	70.4

This is about 1¼° *np* Σ 3040. A prior measure gives:

1868.78	104°.8	71″.7	in	Hd

12573. OΣ 507. (6.8...7.5)

R. A. $23^h 42^m 51^s$ Decl. + 64° 13′

A and B

1908.711	266°.9	0″.67
.750	269.5	0.64
.769	270.6	0.64
1908.74	269.0	0.65

AB and C (7.8)

1908.709	352°.95	49″.27
.711	352.43	49.37
.728	352.42	49.15
1908.72	352.60	49.26

C is bright enough to have some motion, but, if any, it is very small. The measures of OΣ, Δ and β (1847-1908) give for the apparent motion of AB:

Measures	0″.019	in	104°.7
Greenwich	0.027	in	119.0

12575. 6 *Cassiopeiae.* OΣ 508. (5.7...8.2)

R. A. $23^h 43^m 0^s$ Decl. + 61° 33′

A and C (10.8)

1912.622	309°.30	62″.25
.638	309.20	62.42
.657	309.25	62.59
1912.64	309.25	62.42

No other measures of C. The principal stars appear to have a small common proper motion, with no sensible relative change.

Auwers	0″.019	in	238°.7
Groombridge	0.035	in	224.2
Boss	0.010	in	246.6

12581. H 5423. (6.0...12.4)

R. A. $23^h 43^m 37^s$ Decl. — 26° 0′

1910.627	309°.3	13″.45
.681	308.8	12.83
.760	308.8	13.49
1910.69	309.0	13.26

The prior measures of this pair are discordant. Not in Boss' *General Catalogue.*

12593. H 3220. (9.5...9.6)

R. A. 23ʰ 45ᵐ 15ˢ Decl. + 1° 45′

1907.657	18°.2	32″.72
.673	18.9	32.78
.675	18.2	32.64
1907.67	18.4	32.71

Probably no real change.

12608. β 996. (6.8...11.7)

R. A. 23ʰ 46ᵐ 34ˢ Decl. + 74° 53′

A and C (9.0)

1907.845	131°.97	163″.20
.865	131.78	162.84
.867	131.63	163.21
1907.86	131.79	163.08

With the measures by Engelhardt in 1894, we have for the proper motion of AB:

0″.325 in 79°.7

The proper motion of the bright star is given in the catalogues:

Greenwich	0″.336	in	82°.4
Porter	0.288	in	81.8
Boss	0.333	in	81.0

Later measures:

1910.644	131°.70	162″.50
.660	131.83	162.92
.666	132.00	162.89
1910.66	131.84	162.77

12615. OΣ 511. (6.8...11.0)

R. A. 23ʰ 47ᵐ 8ˢ Decl. + 60° 2′

A and C (11.0)

1911.698	129°.75	69″.22
.720	129.95	69.45
.736	130.17	69.19
1911.72	129.96	69.29

For the proper motion of AB. There is a 14 m star near A:

1911.72	39°.4	36″.02

The motion of A is uncertain from the meridian observations:

Greenwich	0″.012	in	94°.8
Battermann	0.024	in	209.6

A and β 1153 (AB)

1911.698	245°.88	176″.30
.720	245.72	176.16
.736	245.90	176.79
1911.72	245.83	176.42

No change in this since my measures in 1889.

12618. OΣ (App.) 251. (6.3...9.0)

R. A. 23ʰ 47ᵐ 31ˢ Decl. + 50° 51′

A and B

1910.720	200°.58	43″.65
.739	200.33	43.95
.742	200.70	43.54
1910.73	200.54	43.71

A and C (11.1)

1910.720	129°.50	50″.10
.739	128.90	50.32
.742	129.33	50.02
1910.73	129.24	50.15

Change from proper motion of A. The measures of AB (1875-1910) give:

Measures	0″.076	in	83°.2
Greenwich	0.066	in	79.6

12639. Σ 3046. (8.0...8.5)

R. A. 23ʰ 50ᵐ 15ˢ Decl. — 10° 10′

A and B

1909.744	252°.5	3″.11
.780	251.4	3.19
.782	250.7	3.11
1909.77	251.5	3.14

As this appears to be a pair of the 61 *Cygni* type, I have connected a very faint star.

A and C (13.0)

1909.780	232°.10	114″.21
.782	232.20	114.24
1909.78	232.15	114.22

No other measures of C. The proper motion of A is given:

Stumpe	0″.352	in	248°.5
Paris	0.288	in	270.0

12645. β 1224. (6.6...13.3)

R. A. 23ʰ 50ᵐ 53ˢ Decl. + 55° 10′

A and C (11.7)

1912.619	356°.70	77″.50
.622	356.90	76.68
.638	356.80	77.33
1912.62	356.80	77.17

For the proper motion of A. This from the star catalogues is very uncertain:

Auwers	0″.028	in	206°.1
Groombridge	0.030	in	101.5

12651. OΣ 512. (6.6...10.9)

R. A. $23^h 51^m 18^s$ Decl. + 60° 22′

1910.586	292°.7	3″.24
.608	291.6	3.21
.627	292.8	3.61
1910.61	292.4	3.35

The proper motion of A is:

Battermann	0″.029	in	248°.1

h 2285 is 10′ *n;* many small stars, and of no special interest.

12654. H 321. (7.5...11.2)

R. A. $23^h 51^m 38^s$ Decl. + 10° 48′

1911.813	132°.6	20″.93
.835	133.2	21.11
.870	132.9	20.75
1911.84	132.9	20.93

No early measures.

12655. Σ 3047. (8.7...8.7)

R. A. $23^h 51^m 50^s$ Decl. + 56° 43′

A and C (12.5)

1909.744	189°.8	7″.98
.760	190.3	7.92
.763	189.3	8.29
1909.76	189.8	8.06

Change uncertain.

12656. Σ 3048. (7.7...8.8)

R. A. $23^h 51^m 57^s$ Decl. + 23° 41′

A and C (10.0)

1909.760	242°.68	46″.72
.780	242.52	46.51
.782	243.17	46.52
1909.77	242.79	46.58

The only other measure is that in G. C. Part II. The two positions give for the proper motion of A:

Measures	0″.195	in	196°.4
Stumpe	0.198	in	203.8
Porter	0.182	in	201.2

Further measures of C should be made.

12657. H 995. (8.5...11.0)

R. A. $23^h 51^m 58^s$ Decl. + 27° 59′

1907.485	18°.6	6″.28
.540	17.5	6.12
.559	18.0	6.04
1907.53	18.0	6.15

Change is probable.

12663. R *Cassiopeiae*. Espin 37.

R. A. $23^h 52^m 19^s$ Decl. + 50° 43′

A and B (11.8...13.8)

1910.678	272°.9	14″.12
.701	272.6	13.85
1910.69	272.7	13.98

A and C (10.5)

1910.678	330°.0	27″.85
.681	331.6	27.62
.684	331.0	28.00
1910.68	330.9	27.82

The only other measures are given in the *General Catalogue*, Part I. The principal star is variable.

12666. σ *Cassiopeiae*. Σ 3049. (5.4...7.5)

R. A. $23^h 52^m 55^s$ Decl. + 55° 5′

A and C (10.5)

1909.493	66°.90	109″.48
.570	66.87	109.37
.573	66.85	109.60
1909.55	66.87	109.48

A prior measure is:

1879.79	66°.68	110″.37	2n	Bl

The proper motion of the large star is very uncertain, and the measures of AC should be continued.

Measures of C	0″.032	in	45°.0
Auwers	0.018	in	214.5
Groombridge	0.034	in	74.7
Boss	0.012	in	114.2

12673. H 3229. (10.5...11.0)

R. A. $23^h 53^m 18^s$ Decl. + 6° 26′

1909.627	144°.9	8″.18
.630	143.5	7.78
.725	142.9	8.39
1909.66	143.8	8.12

No other measures.

12675. Σ 3050. (6.0...6.0)

R. A. $23^h 53^m 23^s$ Decl. + 33° 4′

A and C (12.8)

1909.744	288°.80	82″.28
.763	288.90	82.20
.780	288.85	82.07
1909.76	288.85	82.18

One of the nearly equal components of Σ 3050 has a small proper motion of about 0″.026 in 160° (± 180°). Later measures of the small star will show whether it is A or B, if only one.

The general motion of the two large stars is given:

Boss	0″.106	in	220°.5

12685. H 1923. (11.0...11.4)

R. A. $23^h\ 54^m\ 16^s$ Decl. + 50° 3′

1910.605	277°.9	12″.18
.608	278.7	11.60
.627	280.3	11.53
1910.61	279.0	11.77

H 1923 is in *h* 2292; of which the principal stars are DM (49°) 4303-4-5. No other measures.

12693. OΣ (App.) 254. (6.3...7.7)

R. A. $23^h\ 55^m\ 8^s$ Decl. + 59° 41′

A and B

1909.438	89°.60	58″.62
.473	89.25	58.52
1909.46	89.42	58.57

A and *a* (9.8)

1909.438	323°.83	155″.87
.473	323.85	155.68
.493	323.97	155.62
1909.47	323.88	155.72

B and *b* (9.9)

1909.438	129°.45	134″.47
.473	129.28	134.34
.493	129.77	134.42
1909.47	129.50	134.41

For the small stars we have:

1879.47	323°.96	156″.46	3n	Bl
1879.47	129.59	134.24	3n	Bl

The measures of the small stars should be continued. No proper motion of the large stars found in the catalogues.

12696. Hn 60. (8.5...8.9)

R. A. $23^h\ 55^m\ 17^s$ Decl. + 38° 58′

1907.695	316°.5	0″.31

Rapid motion; a difficult pair.

12701. 85 *Pegasi.* β 733. (6.0...12.5)

R. A. $23^h\ 55^m\ 54^s$ Decl. + 26° 27′

A and C (9.0)

1907.638	338°.20	43″.78
.657	338.45	43.72
.673	338.36	43.70
1907.66	338.34	43.73

A and D (13.0)

1907.657	291°.90	93″.34
.673	292.90	93.38
.675	292.50	94.08
.692	292.20	93.88
1907.67	292.38	93.67

The nine positions of D (1878-1907) give for the proper motion of 85 *Pegasi:*

1″.317 in 138°.0

The close agreement of this value with that found from the measures of AC is very satisfactory when the shorter interval of time, and the extreme faintness of the more distant star are taken into account.

From the measures of AC (1851-1905):

1″.286 in 139°.5

Some of the values from meridian observations are:

Argelander	1″.390	in	135°.1
Madler	1.376	in	133.3
Brunnow	1.259	in	133.6
Auwers	1.288	in	139.7
Porter	1.287	in	138.9
Boss	1.292	in	139.8

Later measures of AD:

1910.678	293°.25	96″.73
.681	293.13	97.11
.701	293.72	96.74
.739	293.70	96.82
1910.70	293.45	96.85

12703. Ho 209. (8.5...11.0)

R. A. $23^h\ 56^m\ 12^s$ Decl. + 32° 18′

A and C (13.0)

1908.826	140°.6	17″.86
9.706	139.7	17.74
9.742	139.3	17.74
1909.42	139.9	17.78

Change uncertain.

1906.53	139°.1	17″.72	3n	Doo.

12704. Σ 3053. (6.0...7.3)

R. A. $23^h\ 56^m\ 27^s$ Decl. + 65° 26′

A and C (10.8)

1911.698	289°.98	98″.54
.720	290.20	98.28
.736	289.75	98.69
1911.72	289.98	98.50
1912.619	289°.90	98″.31
.622	289.55	98.55
.638	290.00	99.03
1912.62	289.82	98.63

For the common proper motion of AB. The catalogues leave this very uncertain.

Auwers	0″.034	in	190°.4
Schroeter	0.015	in	180.0
Boss	0.017	in	106.6

12709. β 281. (7.5...11.0)

R. A. 23^h 56^m 38^s Decl. + 1° 28′

A and C (11.0)

1910.586	335°.0	33″.59
.589	334.2	33.78
.605	333.7	34.55
1910.59	334.3	33.97

The proper motion of AB from the measures of C to 1898 will not be materially changed.

Measures	0″.095	in	154°.0
Boss	0.079	in	154.1

12716. β 861. (9.4...9.7)

R. A. 23^h 56^m 55^s. Decl. + 69° 2′

A and B

1907.692	177°.4	1″.35
.731	177.8	1.42
.750	175.5	1.41
1907.72	176.9	1.39

A and C (13.4)

1907.731	47°.3	16″.72
.750	46.1	15.88
1907.74	46.7	16.30

There is another star 13.8 m near A, 273°.3 : 16″.8.

12724. Σ 3055. (7.0...11.2)

R. A. 23^h 57^m 51^s Decl. + 11° 29′

A and C (12.4)

1912.867	31°.73	122″.85
.890	31.77	122.70
.925	31.10	122.15
1912.89	31.53	122.57

For the proper motion of the principal star. No other measures. No change in AB.

12731. Σ 3056. (7.4...7.4)

R. A. 23^h 58^m 30^s Decl. + 33° 36′

AB and C (9.0)

1912.810	359°.4	22″.96
.813	359.0	22.88
.829	359.8	22.98
1912.82	359.4	22.94

AB and D (9.7)

1912.810	238°.00	95″.59
.813	238.15	96.00
.829	237.95	95.45
1912.82	238.03	95.68

I have given in the *General Catalogue* the proper motion of the close pair from the measures of C (1831-1904). The later observations will not sensibly change that result.

0″.036 in 205°.7

There are no other measures of D.

12740. OΣ 547. (8.3...8.3)

R. A. 23^h 59^m 12^s Decl. + 45° 9′

A and C (13.0)

1911.468	217°.9	38″.25
.529	218.4	38.18
.545	218.4	38.10
1911.51	218.2	38.18

A and D (11.0)

1911.433	174°.88	86″.00
.468	175.23	85.54
.487	175.75	86.14
1911.46	175.29	85.89

A and E (11.0)

1911.433	60°.68	86″.17
.468	60.40	86.35
.487	60.65	85.98
1911.46	60.58	86.17

For the proper motion of A. This is a system of the 61 *Cygni* type, the two equal components having slightly different proper motions. From the star catalogues we have:

Stumpe	0″.897	in	98°.7
Porter	0.887	in	98.4
Paris	0.929	in	97.9

From the measures of AB (1876-1905) the relative motion of B is:

0″.0595 in 207°.0

Further measures of the faint stars will give an independent value of the proper motion of A.

12741. OΣ (App.) 255. (7.8...8.2)

R. A. 23^h 59^m 14^s Decl. + 15° 40′

1912.829	336°.98	89″.34
.867	337.40	88.74
.884	337.07	89.23
1912.85	337.15	89.10

No change since the measures by Dembowski in 1874.

12750. Σ 3060. (8.5...8.7)

R. A. 23^h 59^m 47^s Decl. + 17° 25′

A and C (11.0)

1912.755	262°.15	80″.70
.791	262.15	80.15
.793	261.80	80.83
1912.78	262.03	80.56

Σ 3060 appears to belong to the 61 *Cygni* type, with a very small relative rectilinear motion, and I have therefore measured a third star for the proper motion of A. This has been given:

Battermann	0″.262	in	229°.7

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